Service Manual

LCD Monitor Acer S243HL

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Appendix : User's manual

Acer S243HL Service Manual

Important Safety Notice

1. Safety precautions

This monitor is manufactured and tested on a ground principle that a user's safety comes first. However, improper used or installation may cause damage to the monitor as well as to the user.

Warning:

- This monitor should be operated only at the correct power sources indicated on the label on the rear of the monitor. If you're unsure of the power supply in you residence, consult your local dealer or Power Company.
- Do not try to repair the monitor by yourself, as it contains no user-serviceable parts. This monitor should only be repaired by a qualified technician.
- Do not remove the monitor cabinet. There are high-voltage parts inside that may cause electric shock to human bodies.
- Stop using the monitor if the cabinet is damaged. Have it checked by a service technician.
- Put your monitor only in a lean, cool, dry environment. If it gets wet, unplug the power cable immediately and consult your closed dealer.
- Always unplug the monitor before cleaning it. Clean the cabinet with a clean, dry cloth. Apply non-ammonia based cleaner onto the cloth, not directly onto the class screen.
- Do not place heavy objects on the monitor or power cord.

2. Product safety notice

Many electrical and mechanical parts in this chassis have special safety visual inspections and the protection afforded by them cannot necessarily be obtained by using replacement components rated for higher voltage, wattage, etc. Before replacing any of these components read the parts list in this manual carefully. The use of substitute replacement parts, which do not have the same safety characteristics as specified in the parts list, may create shock, fire, or other hazards.

3. Service notes

- When replacing parts or circuit boards, clamp the lead wires around terminals before soldering.
- Keep wires away from high voltage, high temperature components and sharp edges.
- Keep wires in their original position so as to reduce interference.
- Adjustment of this product please refers to the user' manual.

01 Product Specification

1. General:

Acer S243HL is designed with LVDS interface, VGA/Dual-HDMI input, LED panel and over driver function. it featured with DC 19V adapter power supplies and audio input. It's a green product and meets all ROHS standard. The power button and display control buttons are on the base of the monitor. The monitor shall automatically to display lower resolution video modes into 1920x1080 full screen display. The image can be adjusted through OSD control. It support HDCP, Color management and ACM function.

1.1 Main Features

Features		Specifications
Maximum resolution		1920(x3) x 1080 @ 60Hz
Back light system		2 LED lightbar (top & bottom edge side)
Pixel pitch		276.75 um (per one triad) x 276.75 um (V)
Display area		531.36mm (H) x 298.89mm (V)
Contrast ratio		8,000,000:1(ACM ON)
Brightness		250cd/m² (TYP.)
Response time (Tr+Tf)		2ms(GTG)
Viewing angle		170° (H)/ 160°(V), (TYP.)
Input interface		Analog (D-sub 15 pin) Digital (HDMIx2)
Audio system		2 W *1
Plug & Play		VESA DDC/CI
Power supply		DC 19V adapter
OSD language	For Non-EMEA	English, Deutsch, Español, 简体中文, 繁體中文, Français, Italiano, 日本語
	For EMEA	English, Deutsch, Español, Dutch, Russian, Français, Italiano, Finnish

1.2 Accessories

Items	VGA cable	Audio cable	User's manual	Warranty card	Quick-start Guide
Description	1.8m	1.8m	Multi	Multi	Multi
Option	●	●	●	●	●

2. Operation Specifications

The unit should suffer no visible cosmetic damage and should operate with no degradation in display quality during exposure to the operating conditions and after exposure to the non-operating conditions, in any sequence.

2.1 Environmental conditions

Operating	Specification
Low Temperature	0°C (Relative Humidity is as low as possible), 12 hrs.
High Temperature	+40°C / 20% R.H., 12 hrs.
High Humidity	+32°C/ 80% R.H., 12 hrs
Altitude	12,000 feet at 25°C (hold 3.5 hrs)
Storage	
Low Temperature	-30°C / humidity not controlled
High temperature &low humidity	+65°C/ 10% R.H.
Test Profile	+25°C/ 50%R.H.(2hrs)-> -30°C/ No R.H.(12hrs).-> +41°C/ 90% R.H.(12hrs)->+65°C/ 10% R.H.(12 Hrs)->+25°C/ 50% R.H.(2hr)
Max. Wet Bulb Temp	39°C
Altitude	40,000 feet at -30 °C (hold 1 hr)

Notice:1.Altitude Ramp rate: <= 3,500 feet per minute

2. Packed properly with PE bag, cushion material, carton & seal tape

3. power off when test storage

2.2 Safety, EMC, Ergonomics and Compatibility Requirements

Items	Description						
Safety	GS	CB	TUV/GS	CCC	BSMI	SASO	
	●	●	●	●	●	●	
EMC	FCC-B	CE/EMC	VCCI C	C-Tick	CCC	BSMI	SASO
	●	●	●	●	●	●	●
Ergonomics	Ergo	TCO’03	cTUVus	China energy			
	●	●	●	●			
Compatibility	Windows 95/98/Me		Windows 2000	Windows XP			Windows Vista
	●		●	●			●
Power Management	Energy Star 5.0						
	●						

2.3 Electrostatic Discharge Requirements

Item	Condition	Spec	
Electrostatic Discharge	IEC61000-4-2(EN55024)	Contact discharge: 4KV	
		Contact discharge: 8KV	●
		Air discharge : 8KV	
		Air discharge : 15KV	●

2.4 Reliability

Items	Condition	Spec	Note
MTBF	Operating condition is 25°C	≧ 60,000 Hours	Except panel
LED Life time	Luminance becomes 50%	15,000 Hours(TYP)	Note1

Note1. Operating with fixed driving current

3. Electrical and Optical Characteristics and Performance

3.1 Main Power Supply

3.1.1 Adapter characteristics

Items	Condition	Spec	Note
AC Input Voltage range	Universal input full range	90~264Vac	
AC Input Voltage rating	Universal input full range	100~240Vac	
AC input frequency range	90~264Vac	47~63Hz	
AC input frequency rating	100~240Vac	50~60Hz	
AC Input Current	100Vac	1.2A	
	240Vac	0.6A	
Inrush Current	100Vac,cold star,25°C	35A (max)	See Note1
	240Vac,cold star,25°C	70A(max)	
DC output voltage	+19V output	18.05V~ 19.95V	
DC output loading capability		2.1A (max)	
Output Ripple and Noise	With dummy load	350mV	
Rise Time		<40mS	
Hold-up time	With system	>10mS	
	With dummy load	>6mS	
Overshoot		<10%	
Turn on delay time		2S	
Efficiency		≥80%	
Power management			See Table-1

Note1. Before each test, the buck capacitor needs to be discharged.
Before each test, it must be 10 minutes at least after the latest test.
Hot star not component be damaged.

3.1.2 Protection characteristics

Protection	Condition	Spec
OVP	nominal AC input	Output voltage<26V Latch off.
OCP	Auto-recovery	<4A
SCP	Auto recovery	No damage.

3.1.3 DC to DC characteristics

Items	Condition	Spec	Note
DC input voltage	+19V input	18~20V	
Ripple and Noise	+5V output	<100mv	With dummy load
	Audio 5V output	<100mv	

	+5V output	<200mv	See note 2 With system
	Audio 5V output	<500mv	
DC Output Voltage	+5V output	Vcc5V:4.85V~5.35V	
	Audio 5V output	audio 5v:4.8V~5.3V	
DC output loading capability		Vcc5V/1.0A Audio 5V/1.0A	
Rise Time		<50mS	
Dynamic load change			
Overshoot		<10%	
Efficiency		≥80%	

Note 2: Tested by DC loading side parallel with a 47uF/EC and 0.1uF/Ceramic Capacitors and measured band-width with DC-20MHz.

Table-1

Status	H-sync	V-sync	Video	Power	LED
Power On	on	on	active	≤ 32W	Blue
Power Saving	off	on	blanked	< 1W	Amber
	on	off	blanked	< 1W	Amber
	off	off	blanked	< 1W	Amber
Power Off	--	--	--	< 1W	Off

3.2 Backlight Power Supply

Items	Specification
Panel	M240HW01 V6 2*8Bar LED
Input Voltage	18---20V
Input current	1.2A (Typ.), 1.5A (Max.)
On/Off switch level	3.6V≧V on≧ 2.0 V (on) -0.3v ≤ V off ≤ 0.8 V (off)
Brightness PWM Duty (ACM Off)	30%~100%
Brightness PWM Duty (ACM On)	0%~100%
LED operating Voltage	38Vrms(min);40.6Vrms (Type); 44.2Vrms (max)
LED Current	
	20mA (Typ.)
	25mA (Max.)
Efficiency	≥80%

3.3 Brightness output

The test to verify specifications in this section shall be performed under the following standard conditions unless otherwise noted.

Temperature	: 25 ± 5°C
Test pattern	: white
Video Resolution	: 1920 x 1080
Video input level	: 700 mV ± 2%
Warm-up time	: 30 minutes

Set brightness control and also contrast control at maximum, to measure the screen center, the light output shall BL ≥ 200 cd/m^2 **.**

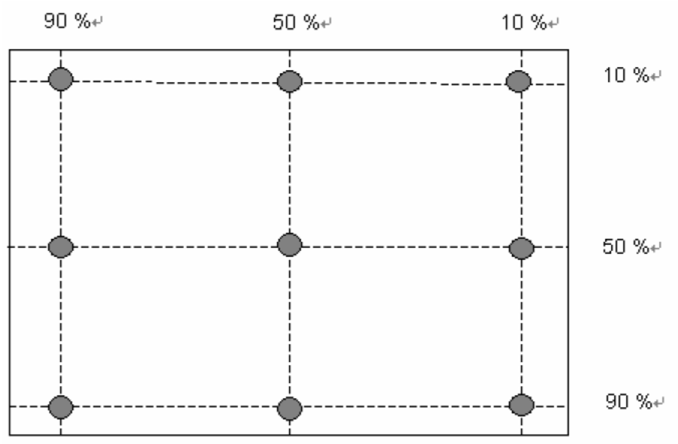
3.4 White balance

The test standard conditions refer to Sec 3.3. (Brightness and contrast are under default value)

Mode		**Chromaticity Coordinate**	
		x	**y**
Cool	9300K	0.283 ± 0.030	0.297 ± 0.030
Warm	6500K	0.313 ± 0.030	0.329 ± 0.030
User		Panel While x	Panel While y

3.5 Brightness uniformity

The test standard conditions refer to Sec 3.3.



$$\frac{\text{Min. luminance of nine points (backlight)}}{\text{Max. luminance of nine points (backlight)}} \geq 70\%$$

4. Input / Output Signal Specifications

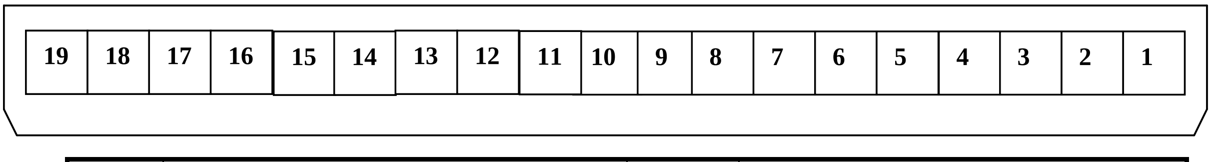
4.1 Audio in

4.1.1 Input impedance ： ≧ 10K ohm

4.1.2 Frequency response range ： 200Hz ~ 20kHz

4.2HDMI x2

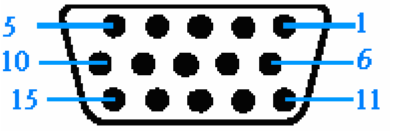
HDMI type A Connector Pin assignment:



Pin	Symbol	Pin	Symbol
1	TMDS Data2+	11	Cable detect
2	TMDS Data2 shield	12	TMDS Clock-
3	TMDS Data2-	13	CEC
4	TMDS Data1+	14	N/C
5	TMDS Data1 shield	15	SCL
6	TMDS Data1-	16	SDA
7	TMDS Data0+	17	DDC/CEC Ground
8	TMDS Data0 shield	18	+5V Power
9	TMDS Data0-	19	Hot Plug Detect
10	TMDS Clock+		

4.3 VGA in

4.3.1 D-sub Connector Pin assignment:



Pin	Symbol
1	Red Video
2	Green Video
3	Blue Video
4	N/C
5	Cable detect
6	Red Ground
7	Green Ground
8	Blue Ground
9	PC +3.3/+5V
10	Sync. Ground
11	N/C
12	DDC SDA
13	H sync
14	V sync
15	DDC SCL

4.3.2 Signal SPEC:

Items	Condition	Specification
Analog RGB signal	Input impedance =75 Ohm	0.7Vp-p
Sync	Input impedance ≧1k Ohm	TTL level, Separate H/V-sync(+/-)
H-Sync Frequency		30K~80KHz
V-Sync Frequency		55~75Hz

4.4 Timing table

Mode	Resolution (active dot)	Resolution (total dot)	Horizontal Frequency (KHz)	Vertical Frequency (Hz)	Nominal Pixel Clock (MHz)	Write in EDID
	640x480@60Hz	800 x 525	31.469	59.941	25.175	23H
	640x480@72Hz	832 x 520	37.861	72.809	31.500	N/A
MAC	640x480@66.66Hz	864x525	35	66.66	30.24	23H
VESA	720x400@70Hz	900x449	31.469	70.087	28.322	23H
SVGA	800x600@56Hz	1024 x 625	35.156	56.250	36.000	23H
	800x600@60Hz	1056 x 628	37.879	60.317	40.000	23H
	800x600@72Hz	1040 x 666	48.077	72.188	50.000	N/A
	1024x600@60Hz	1312x622	37.320	60.000	48.964	N/A
XGA	1024x768@60Hz	1344x806	48.363	60.004	65.000	24H
	1024x768@70Hz	1328x806	56.476	70.069	75.000	24H
VESA	1152x864@75Hz	1600x900	67.5	75	108	26H~27H
	1280x960@60Hz	1800x1000	60	60	108	N/A
SXGA	1280x1024@60Hz	1688x1066	63.981	60.020	108.000	25H
VESA	1280x720@60Hz	1650x750	44.955	59.940	74.176	N/A
WXGA	1280x800@60Hz	1680x831	49.702	59.810	83.500	28H~29H
	1360x768@60Hz	1792x795	47.712	60.015	85.500	N/A
WXGA+	1440x900@60Hz	1904x931	55.935	59.887	106.500	2AH~2BH
WSXGA+	1680x1050@60Hz	2240*1089	65.290	59.954	146.250	N/A
UXGA	1600x1200@60Hz	2160x1250	75.000	60.000	162.000	N/A
	1920x1080@60Hz	2576x1120	67.158	59.963	173.000	2C~2D
	1920x1080@60Hz	2200x1125	67.500	60.000	148.500	36H~46H
	1920x1080@60Hz	2080x1111	66.587	59.934	138.500	

4.5 HDMI timing table

For DVD Player Input, Attached timing is supported :

Mode	Resolution	Pixel Clock MHz	H sync KHz	V sync Hz
VGA	640 x 480p	25.2	31.5	60
NTSC (480i) 4:3	720 x 480	13.50	15.73	60
NTSC (480i) 16:9	720 x 480	13.50	15.73	60
NTSC (480p) 4:3	720 x 480	27.00	31.47	60
NTSC (480p) 16:9	720 x 480	27.00	31.47	60
PAL (576i)	720 x 576	13.50	15.63	50
PAL (576p) 4:3	720 x 576	27.00	31.27	50
PAL (576p) 16:9	720 x 576	27.00	31.27	50
720p	1280 x 720	74.25	37.5	50
720p	1280 x 720	74.25	44.96	60
1080i	1920 x 1080	74.25	28.125	50
1080i	1920 x 1080	74.25	33.72	60
1080P	1920 x 1080	148.50	56.250	50
1080P	1920 x 1080	148.50	67.50	60

4.6 Audio output SPEC

Items	Specification			TEST CONDITIONS
	Min	TYP	MAX	
Output power (W)	1.6	2.0	2.4	THD+N = 10%，AT 1KHz 1Vrms
Output impedance (Ω)	3.4	4	4.6	AT 1KHz 1Vrms
Total harmonic distortion plus noise	---	---	10%	Po≦ 2.0W
Signal to noise ratio (dB)	40	---	---	THD+N≦ 5%
PWM frequency (KHz)	200	250	300	

Note: The low pass RC Filter (R=100Ω / C=0.047uF) for Class-D Output Power and THD+N Measurement

4.7 DDC data

EDID File Format : VESA's EDID Standard Version #3, Revision #0,

EDID Structure : Version #1, Revision #3.

EDID Data Table : See the attached table (for example)

4.7.1 VGA EDID table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	04	72	CF	AD	00	00	00	00
1	19	13	01	03	08	35	1E	78	EA	60	85	A6	56	4A	9C	25
2	12	50	54	B3	0C	10	71	4F	81	00	95	00	D1	C0	01	01
3	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
4	45	00	13	2B	21	00	00	1A	00	00	00	FC	00	53	32	34
5	33	48	4C	0A	20	20	20	20	20	20	00	00	00	FD	00	38
6	4C	1F	53	12	00	0A	20	20	20	20	20	20	00	00	00	FF
7	00	30	30	30	30	30	30	30	30	30	30	30	30	0A	00	BD

4.7.2 HDMI EDID table

	0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F
0	00	FF	FF	FF	FF	FF	FF	00	04	72	CF	AD	00	00	00	00
1	19	13	01	03	80	35	1E	78	EA	60	85	A6	56	4A	9C	25
2	12	50	54	B3	0C	10	71	4F	81	00	95	00	D1	C0	01	01
3	01	01	01	01	01	01	02	3A	80	18	71	38	2D	40	58	2C
4	45	00	13	2B	21	00	00	1A	00	00	00	FC	00	53	32	34
5	33	48	4C	0A	20	20	20	20	20	20	00	00	00	FD	00	37
6	4B	1E	50	12	00	0A	20	20	20	20	20	20	00	00	00	FF
7	00	30	30	30	30	30	30	30	30	30	30	30	30	0A	01	4A
0	02	03	22	F2	23	09	7F	07	4E	01	02	03	84	05	06	07
1	10	11	12	15	93	1F	14	83	01	00	00	66	03	0C	00	10
2	00	00	8C	0A	D0	8A	20	E0	2D	10	10	3E	96	00	13	2A
3	21	00	00	18	01	1D	00	72	51	D0	1E	20	6E	28	55	00
4	13	2A	21	00	00	1E	01	1D	80	18	71	1C	16	20	58	2C
5	25	00	13	2A	21	00	00	9E	01	1D	00	BC	52	D0	1E	20
6	B8	28	55	40	13	2A	21	00	00	1E	01	1D	80	D0	72	1C
7	16	20	10	2C	25	80	13	2A	21	00	00	9E	00	00	00	FF

5. Function Specifications

All the tests to verify specifications in this section shall be performed under the following standard conditions unless otherwise noted. The standard conditions are:

Temperature	: 25 ± 5°C
Warm-up time	: 30 minutes minimum
Checking display modes	: All the specified modes

5.1 Panel general specifications

Item	Describe
Supplier	AUO
Model name	M240HW01 V6
Display Area(mm)	531.36(H)x298.89(V)
Pixel Pitch(mm)	0.27675(H) ×0. 27675 (V)
Display Colors	16.7M colors (RGB 6-bit + Hi_FRC)
Number of Pixel	1920(H) × 1080(V),Full HD
Brightness	250 cd/m^2 (TYP.)
Contrast Ratio	1000 (TYP.)
Viewing Angle	170 (Horizontal) / 160(Vertical) (CR≧10)
Display Mode	Normally White
Response Time	5ms (TYP. ON/OFF)
Surface Treatment	Anti-Glare, 3H
Lamp	2 LED lightbars
Outline Dimension	556.0(W) ×323.2(H) ×9.90(D)

Notice: Other second panel please refer to panel spec

5.2 Optical characteristic of LCD panel

The test methods for the below items' definition, please refer to the specification of **INL MT230DW01** panel.

Item	Unit	Conditions		Min.	Typ.	Max.	Remark
Viewing Angle (CR >= 10)	[degree]	Horizontal	Right	150	170	-	
			Left			-	
	[degree]	Vertical	Up	140	160	-	
			Down			-	
Contrast ratio		Normal Direction		600	1000		
Response Time	[msec]	Rising Time		-	3.5	7.4	
	[msec]	Falling Time		-	1.5	2.6	
	[msec]	Rising + Falling		-	5	10	
Color Chromaticity (CIE)		Red x		Typ-0.03	0.640	Typ+0.03	
		Red y			0.349		
		Green x			0.284		
		Green y			0.617		
		Blue x			0.142		
		Blue y			0.067		
Color Coordinates (CIE) White		White x			0.313		
		White y			0.329		
Luminance Uniformity	[%]	9 points measurement		70%	75%		
White Luminance at CCFL 7.5mA(center point)	[cd/m^2]			200	250	-	

5.3 Keypad Function

5.3.1 Control buttons

[POWER]	Power on or power off the monitor
[►], [◄]	A. When "Main OSD" displays, press these keys to change the contents of an adjustment item, or change an adjustment value B. When "Main OSD" un-displays, press [►] to show "Audio" OSD and increase the volume, press [◄] to show "Audio" OSD and decrease the volume .
[MENU]	A. When "Main OSD" un-displays, press [MENU] to enter OSD interface. B. When "Main OSD" displays, press [MENU] to perform function of menu icon that is highlight or enter next level menu.
[AUTO]	A. When "Main OSD" un-displays, press [AUTO] to perform auto-adjustment B. When "Main OSD" displays, press [AUTO] to return to previous level menu C. When "Empowering Technology OSD" displays, press [AUTO] to exit the OSD
[e Color]	A. When "Main OSD" un-displays, press [e Color] to show "Empowering Technology OSD". B. When "Main OSD" displays, press [e Color] to exit the OSD, and to show "Empowering Technology OSD"

5.3.2 Hot Key Operation

FUNCTION	HOT KEY OPERATION						DESCRIPTION
	e Color	AUTO	MENU	◄	►	POWER	

FACTORY MODE	•					ON	Press [e], and then press [POWER] for DC power on. OSD menu will be shown with “F” on the left top. Select “F” for entering factory mode.

5.4 OSD Structure

The On-Screen Display (OSD) shall be an easy to use icon based menu through keypad OSD buttons or remote control unit. The unit shall leave the factory with all OSD controls set to their default values.

First	Second	Third	Fourth	Control Range	Default Value	
Picture	Acer e color Management	empowering Technology	User	---	Standard	
			Text			
			Standard			
			Graphics			
			Movie			
	Brightness	---	---	0～100	User mode	77
					Text mode	44
					Standard mode	77
					Graphics mode	97
					Movie mode	77
	Contrast	---	---	0～100	User mode	50
					Text mode	50
					Standard mode	50
					Graphics mode	60
					Movie mode	56
	H. Position	---	---	0～100	50	
	V. Position			0～100	50	
	Focus			0～100	---	
	Clock			0～100	50 (1)	
	Color Temp	Warm	---	---	(Default color temp)	
		Cool	---	---	---	
		User	Red	0～100	80	
			Green	0～100	80	
			Blue	0～100	80	
	Auto Configure	---	---	---	---	
OSD	H. Position	---	---	0～100		
	V. Position	---	---	0～100	3	
	OSD Timeout	---	---	10～120	10	
Setting	Wide Mode	Full	---	---	Full	
		Aspect	---	---		
	DDC/CI	ON	---	---	ON	
		OFF				
	ACM	ON	---	---	OFF	
		OFF				
	Input	VGA	---	---	---	
		HDMI-1	---	---		
		HDMI-2	---	---		

	Language	**EMEA**	**NO-EMEA**	---	---	English
		English	English	---	---	
		Russian	繁體中文	---	---	
		Deutsch	Deutsch	---	---	
		Français	Français	---	---	
		Español	Español	---	---	
		Italiano	Italiano	---	---	
		Dutch	简体中文	---	---	
		Finnish	日本語	---	---	
	Reset	---		---	---	---
Info	Resolution	---		---	---	(2)
	H. Freq	---		---	---	
	V. Freq	---		---	---	
	Input Type	---		---	---	
	S/N	---		---	---	
Volume	---	---		---	0～100	50

Notes: (1) Clock default 50 is for Visa timing. Others depend on timing.

(2) Depend on timing & S/N

5.5 OSD Translation

Main menu (NO_EMEA)

nglish 英语)	繁體中文	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	简体中文	日本語
e	畫面	Bild	Image	Imagen	Immagine	画面	ピクチャー
ness	亮度	Helligkeit	Luminosité	Brillo	Luminosità	亮度	輝度
ast	對比	Kontrast	Contraste	Contraste	Contrasto	对比度	コントラスト
sition	水平位置	H.Position	H.Position	H.Posicion	O.Posizione	水平位置	水平位置
ition	垂直位置	V.Position	V.Position	V.Posicion	V.Posizione	垂直位置	垂直位置
s	相位	Fokus	Netteté	Nitidez	Nitidezza	相位	フェーズ
	時脈	Takt	Fréquence	Reloj	Orologio	时序	クロック
r Temp	色溫	Farbtemp.	Temp. Couleur	Temp. Color	Temp. Colore	色温	色溫度
	暖色溫	Warm	Chaud	Càlido	Caldo	暖色温	暖色
	冷色溫	Kalt	Clair	Frio	Freddo	冷色温	寒色
	使用者設定	Anwender	Utilisateur	Usuario	Utente	使用者设定	ユーザー設定
	紅色	Rot	Rouge	Rojo	Rossa	红色	赤
n	綠色	Grün	Vert	Verde	Verde	绿色	緑
	藍色	Blau	Bleu	Azul	Blu	蓝色	青
Config	自動調整	Autom. Abgl.	Autoréglage	Autoajuste	Autoregolazione	自动调整	自動調整
	OSD						
Timeout	OSD 顯示時間設定	OSD-Dauer	Délai de l'OSD	T. de espera OSD	Intervallo OSD	OSD 显示时间设定	OSD 表示時間設定
g	設定	Einstellung	Réglages	Configuración	Impostazione	设置	設定
Mode	寬螢幕模式	Vollbild	Plein écran	Completa	Schermo intero	宽屏模式	ワイドモード
	全螢幕	Vollbild	Plein écran	Completa	Pieno	全屏	全画面
ct	Aspect						
	輸入	Eingang	Entrée	Entrada	Input	输入	入力
uage	語言	Sprache	Langue	Idioma	Lingua	语言	言語
	恢復出廠模式	Rücksetzen	Restaurer	Reiniciar	Resetare	恢复出厂模式	リセット
e Wait	請稍待	Bitte warten	Veuillez patienter	Espere, por favor	Attendere prego	请稍待	お待ちください
nation	資訊	Info	Informations	Información	Informazioni	信息	情報
	結束調整	Beenden	Quitter	Salida	Uscita	退出菜单	終了
	進入	Eingabe	Entrez	Introducir	Invio	进入	選択
	移動	Beweg.	Dépla.	Mover	Muovi	移动	移動
	開	EIN	Allumé	ACTIVADO	ATTIVA	开启	オン
	關	Aus	OffEteinte	Apagado	Spento	关闭	オフ
ne	音量	Lautstärke	Volume	Volumen	Volume	音量	音量

Message menu: (NON_EMEA)

nglish 英语)	繁體中文	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	简体中文	日本語
Config e Wait	自動調整 請稍待	Autom. Abgl. Bitte warten	Autoréglage Veuillez patienter	Autoajuste Espere, porfavor	Autoregolazione Attendere prego	自动调整 请稍待	自動調整 お待ちください
Not ected	無訊號線 連接	Leitung nicht angeschlossen	Câble non connecté	Cable no conectado	Cavo non connesso	信号线 无连接	ケーブルが接続されていません
Not rted	不支援 輸入訊號	Frequenzen nicht unterstützt	Fréquences non supportées	Frequencias no soportadas	Frequenza non supportata	输入 不支援	入力はサポートされていません
gnal	無訊號	Kein signal	Pas de signal	Sin señal	Assenza segnale	无讯号	信号なし

Color management OSD (scenario OSD) **language: (NON_EMEA)**

nglish 英语)	繁體中文	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	简体中文	日本語
ard	標準	Standard	Standard	Estándar	Standard	标准	標準
	文字	Text	Texte	Texto	Testo	文本	テキスト
ics	圖形	Grafiken	Images	Gráficos	Grafica	图形	グラフィックス
	電影	Spielfilm	Film	Película	Film	电影	ムービー
	使用者	Benutzer	Utilisateur	Usuario	Utente	用户	ユーザー
t/Exit	調整/結束	Abstimmen/Beenden	Ajuster/Quitter	Ajuste/salir	Regola/Esci	调节/退出	調整/終了
t	選擇	Auswahl	Sélectionner	Seleccionar	Seleziona	选取	選択

Main menu (EMEA)

nglish 英语)	Russian (俄语)	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	Dutch (荷兰语)	Finnish (芬兰语)
e	Изображ.	Bild	Image	Imagen	Immagine	Beeld	Kuva
ness	Яркость	Helligkeit	Luminosité	Brillo	Luminosità	Helderheid	Kirkkaus
ast	Контрастность	Kontrast	Contraste	Contraste	Contrasto	Contrast	Kontrasti
sition	Полож. по гориз.	H.Position	H.Position	H.Posicion	O.Posizione	H. positie	Vaakasijainti
ition	Полож. по верт.	V.Position	V.Position	V.Posicion	V.Posizione	V. positie	Pystysijainti
s	Фокусировка	Fokus	Netteté	Nitidez	Nitidezza	Scherpstelling	Tarkennus
	Частота	Takt	Fréquence	Reloj	Orologio	Klok	Taajuus
r Temp	Цвет.темп.	Farbtemperatur	Temp. Couleur	Temp. Color	Temp. Colore	Kleurtemp.	Värin lämpöisyys
	Теплый	Warm	Chaud	Càlido	Caldo	Warm	Lämmin
	Холодный	Kalt	Clair	Frio	Freddo	Koel	Viileä
	Пользоват.	Anwender	Utilisateur	Usuario	Utente	Gebruiker	Käyttäjä
	Красный	Rot	Rouge	Rojo	Rossa	Rood	Punainen
n	Зеленый	Grün	Vert	Verde	Verde	Groen	Vihreä

	Синий	Blau	Bleu	Azul	Blu	Blauw	Sininen
Config	Автонастройка	Autom. Abgl.	Autoréglage	Autoajuste	Autoregolazione	Autom.configuratie	Autom. asetukset
	OSD						
Timeout	Вр. отобр. Меню	OSD-Dauer	Délai de l'OSD	T. de espera OSD	Intervallo OSD	Time-out OSD	Aikakatkaisu
g	Настр.	Einstellung	Réglages	Configuración	Impostazione	Instelling	Asetus
Mode	Широкоэк.реж.	Bildformate	Mode Large	Modo panorámico	Modo Wide	Breedbeeld modus	Laajakuva
	Полное	Vollbild	Plein écran	Completa	Pieno	Volledig	Täysikuva
ct	Aspect						
	Вход	Eingang	Entrée	Entrada	Input	Ingang	Tulo
uage	Язык	Sprache	Langue	Idioma	Lingua	Taal	Kieli
	Сброс	Rücksetzen	Restaurer	Reiniciar	Resetare	Opn.instellen	Nollaus
e Wait	Подождите	Bitte warten	Veuillez patienter	Espere, por favor	Attendere prego	Een ogenblik geduld	Odota
nation	Информация	Info	Informations	Información	Informazioni	Informatie	Informaatio
	Выход	Beenden	Quitter	Salida	Uscita	Afsluiten	Lopeta
	Ввод	Eingabe	Entrez	Introducir	Invio	Enter	Syötä
	Переме	Beweg.	Dépla.	Mover	Muovi	Verpl.	Liiku
	Вкл	EIN	Allumé	ACTIVADO	ATTIVA	AAN	PÄÄLLÄ <ON>
	Выкл	Aus	OffEteinte	Apagado	Spento	Uit	Pois päältä
ne	Громкость	Lautstärke	Volume	Volumen	Volume	Volume	Äänenvoim.

Message menu: (EMEA)

nglish (英语)	Russian (俄语)	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	Dutch (荷兰语)	Finnish (芬兰语)
Config e Wait	Автонастройка, подождите...	Autom. Abgl. Bitte warten	Autoréglage Veuillez patienter	Autoajuste Espere, por favor	Autoregolazione Attendere prego	Bezig met automatische configuratie, een ogenblik geduld	Autom. asetukset. Odota
Not ected	Кабель не подключен	Leitung nicht angeschlossen	Câble non connecté	Cable no conectado	Cavo non connesso	Kabel niet aangesloten	Kaapeli ei kiinni
Not rted	Вход не поддерживается	Frequenzen nicht unterstützt	Fréquences non supportées	Frequencias no soportadas	Frequenza non supportata	Ingang niet ondersteund	Tuloa ei tueta
gnal	Нет сигнала	Kein signal	Pas de signal	Sin señal	Assenza segnale	Geen signaal	Ei signaalia

Color management OSD(scenario OSD) **language: (EMEA)**

nglish (英语)	Russian (俄语)	Deutsch (德语)	Français (法语)	Español (西班牙语)	Italiano (意大利语)	Dutch (荷兰语)	Finnish (芬兰语)
ard	Стандарт	Standard	Standard	Estándar	Standard	Standaard	Vakio
	Текст	Text	Texte	Texto	Testo	Tekst	Teksti

ics	Изображение	Grafiken	Images	Gráficos	Grafica	Grafische	Grafiikka
	Кино	Spielfilm	Film	Película	Film	Film	Elokuva
	Пользователь	Benutzer	Utilisateur	Usuario	Utente	Gebruiker	Käyttäjä
t/Exit	Настроить /Выход	Abstimmen/Beenden	Ajuster/Quitter	Ajuste/salir	Regola/Esci	Aanpassen/verlaten	Säädä/Lopeta
t	Выбор	Auswahl	Sélectionner	Seleccionar	Seleziona	Selecteren	Valitse

6. Mechanical

6.1 Dimension

Dimension	Spec
Width	569mm
Height	425mm(W/Base&O/BASE)
Depth	192mm(W/Base),122mm(W/O Base)
Monitor Weight	4.2±0.3Kg for AUO panel(AUO panel 2.2Kg)

Remark: If phase in other second panel, the Monitor weight =2.0Kg+second panel weight ±0.3Kg

6.2 Cabinet Material

Cabinet Material	Spec
Cabinet Plastic Material	ABS HB
Front Bezel	BLACK
Back Cover	BLACK
Base	SILVER
Cabinet Texture	ACER SPECIFICATION

6.3 Mechanical Specification

Mechanical	Spec
Bezel Gap Specification	≦1.2mm
Screen printed Parts	NO

6.4 Base Mechanical Interface

items	Spec
Tilt	Compliance with TCO03, -4°(+/-1°) ~+14°(+/-1°)
Wall Mount	NO

7. Package

7.1 Unit Package Specification

7.1.1 Units package

Items	Spec
Packaging	Refer to ME PACKING SPEC
Ink	COLOR
Length	625+/-2.0mm
Height	495+/-2.0mm
Width	186+/-2.0mm
Gross Weight	6.3±0.5kg for AUO panel (AUO panel weight 2.2Kg)
Units per Pallet	40sets/pallet
40' /20' Container Loading, Palletized	840sets/400sets

Remark: If phase in other second panel, the Gross weight =4.1Kg+second panel weight ±0.3Kg

7.1.2 Unit Packing Vibration

Testing with vibration shall be done in each of three mutually perpendicular axes. Axes are referenced to the position of system as it normally sits in front of user, i.e., Front-to-back, side-to-side and top-to-bottom.

7.1.2.1 Random Vibration

Items	Description
Sweep Frequency	1~200Hz
Amplitude	1.14 Grms
Duration Time	30 minute each axis
Direction	3 mutually perpendicular axes (x, y, z)

RANDOM VIBRATION SPECTRUM BREAK POINTS

Frequency (Hz)	PSD, G^2/Hz
1	0.0001
4	0.01
100	0.01
200	0.001

7.1.3 Non operation Thermal Shock Test

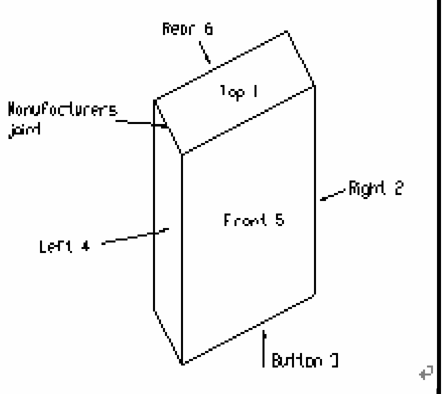
Item	Description
Temperature	-20°C to 60°C
Reset cycles times	25°C>60°C (10hrs)>25°C (2hrs)>-20°C (10hrs)>25°C 3cycles ,every transition time 0.5 hr,
Total cycles	3 cycles

7.1.4 Package Drop

Drop height (Select drop height according to the gross weight refer to the table at below)

Gross Weight(kg)	1.0<W≦9.0
Drop Height(cm)	76
	√

Drop sequence and orientation

Drop	Drop onto	Type Drop	Figure
Step 1	Corner(2-3-5)of package	Corner	
Step 2	Edge(3-5) of package	Edge	
Step 3	Edge(2-3) of package	Edge	
Step 4	Edge(2-5) of package	Edge	
Step 5	Face(bottom-3)of package	Flat	
Step 6	Face(left-4) of package	Flat	
Step 7	Face(front-5) of package	Flat	
Step 8	Face(right-2) of package	Flat	
Step 9	Face(rear-6) of package	Flat	
Step 10	Face(Top-1) of package	Flat	

Mechanical and electrical damage should not exist after vibration test, and shall be submitted for approval customer before mass production.

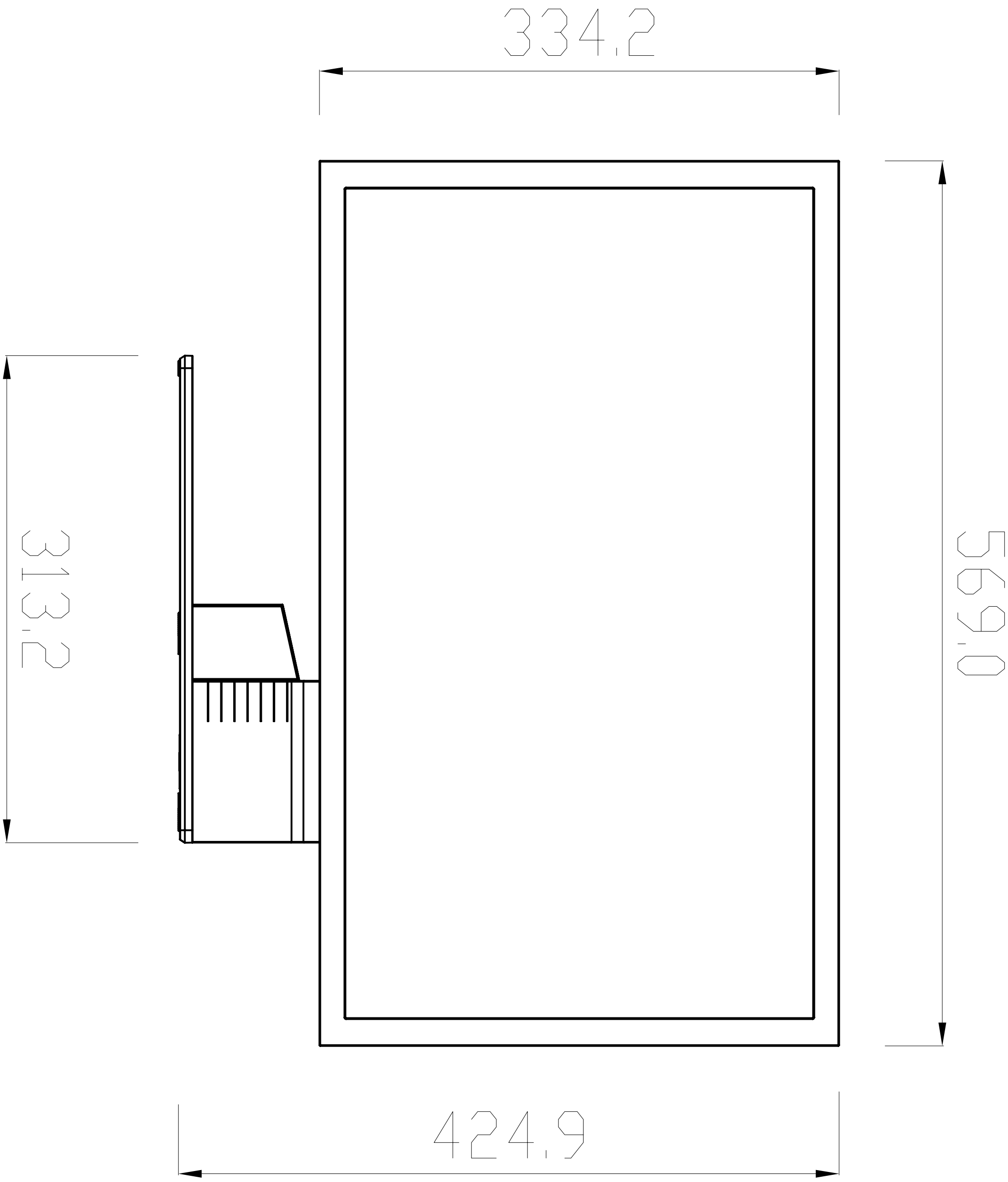
8. Marking and Identification

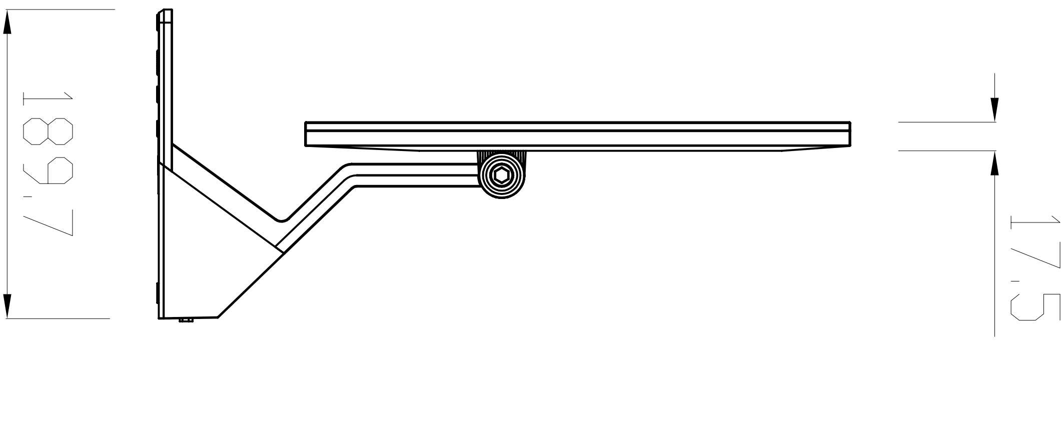
8.1 S/N Label

The approval marking is required by the countries of sales destination.

8.2 Carton label

The approval marking is required by the countries of sales destination.


334.2
313.2
569.0
424.9


189.7
17.5

02. Flat Panel Specification

Module	24" Color TFT-LCD
Model Name	M240HW01 V6

Contents

1.0 Handling Precautions

1) Since front polarizer is easily damaged, pay attention not to scratch it.
2) Be sure to turn off power supply when inserting or disconnecting from input connector.
3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
4) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
5) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
6) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
7) Do not open or modify the Module Assembly.
8) Do not press the reflector sheet at the back of the module to any directions.
9) In case if a Module has to be put back into the packing container slot after once it was taken out from the container, do not press the center of the LED lightbar edge. Instead, press at the far ends of the LED light bar edge softly. Otherwise the TFT Module may be damaged.
10) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
11) After installation of the TFT Module into an enclosure, do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.
12) Small amount of materials having no flammability grade is used in the LCD module. The LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.

2.0 General Description

This specification applies to the 24 inch-FHD Color a-Si TFT-LCD Module M240HW01. The display supports the FHD - 1920(H) x 1080(V) screen format and 16.7M colors (RGB 6-bits + Hi-FRC data). The light source of this TFT-LCD module is W-LED. All input signals are 2-channel LVDS interface and this module doesn't contain a driver for backlight.

2.1 Display Characteristics

The following items are characteristics summary on the table under 25℃ condition:

ITEMS	Unit	SPECIFICATIONS
Screen Diagonal	[mm]	609.7(24.0")
Active Area	[mm]	531.36 (H) x 298.89 (V)
Pixels H x V		1920(x3) x 1080
Pixel Pitch	[um]	276.75 (per one triad) ×276.75
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		TN Mode, Normally White
White Luminance (Center)	[cd/m^2]	250 cd/m^2 (Typ.)
Contrast Ratio		1000(Typ.)
Optical Response Time	[msec]	5ms (Typ., on/off)
Nominal Input Voltage VDD	[Volt]	+5.0 V (Typ)
Power Consumption (VDD line + LED line)	[Watt]	TBD
Weight	[Grams]	TBD
Physical Size	[mm]	556.0(H)x323.2(V)x9.90(D)
Electrical Interface		Dual channel LVDS
Support Color		16.7M colors (RGB 6-bit + Hi_FRC)
Surface Treatment		Anti-Glare, 3H
Temperature Range Operating Storage (Shipping)	 [^{o}C] [^{o}C]	 0 to +50 -20 to +60
RoHS Compliance		RoHS Compliance

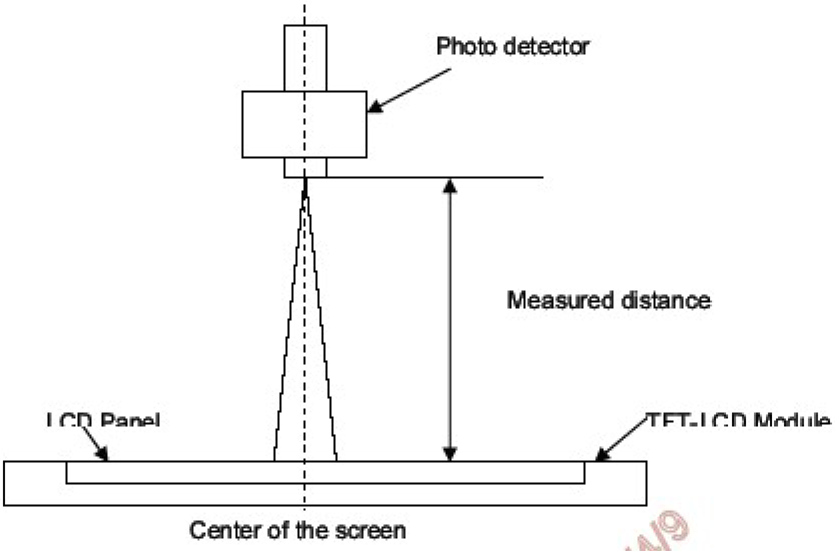
2.2 Optical Characteristics

The optical characteristics are measured under stable conditions at 25℃:

Item	Unit	Conditions	Min.	Typ.	Max.	Note
Viewing Angle	[degree]	Horizontal (Right) CR = 10 (Left)	150	170	- -	2
		Vertical (Up) CR = 10 (Down)	140	160	- -	
Contrast ratio		Normal Direction	600	1000	-	3
Response Time	[msec]	Raising Time (T_{rR})	-	3.5	7.4	
		Falling Time (T_{rF})	-	1.5	2.6	4
		Raising + Falling	-	5	10	
Color / Chromaticity Coordinates (CIE)		Red x		TBD		5
		Red y		TBD		
		Green x		TBD		
		Green y		TBD		
		Blue x		TBD		
		Blue y		TBD		
Color Coordinates (CIE) White		White x	0.283	0.313	0.343	
		White y	0.299	0.329	0.359	
Central Luminance	[cd/m^2]		200	250	-	6
Luminance Uniformity	[%]		70	75	-	7
Crosstalk (in 60Hz)	[%]				1.5	8
Flicker	dB				-20	9

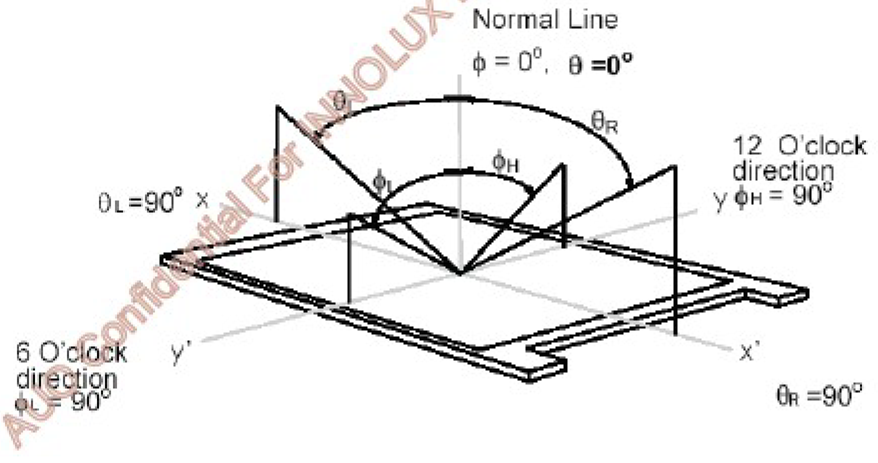
Note 1: **Measurement method**

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring (at surface 35℃). In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 30 minutes in a stable, windless and dark room.



Note 2: **Definition of viewing angle** measured by ELDIM (EZContrast 88)

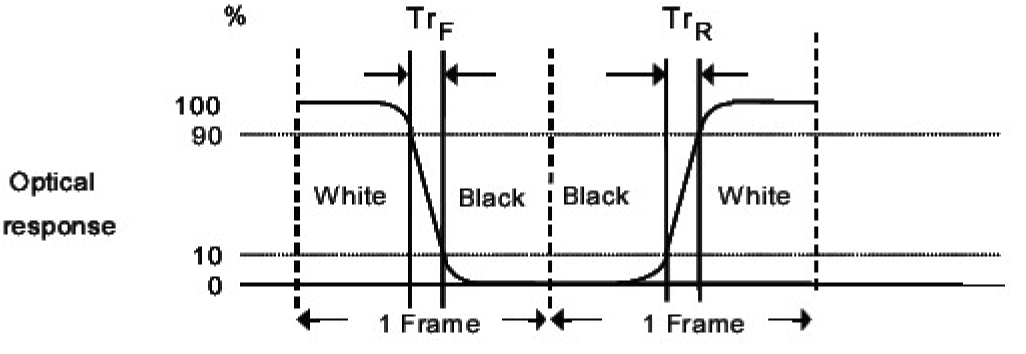
Viewing angle is the measurement of contrast ratio ≧10, at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as follows; 90° (θ) horizontal left and right and 90° (Φ) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.



Note 3: **Contrast ratio is** measured by TOPCON SR-3

Note 4: **Definition of Response time** measured by Westar TRD-100A

The output signals of photo detector are measured when the input signals are changed from "Full Black" to "Full White" (rising time, Tr_R), and from "Full White" to "Full Black" (falling time, Tf_F), respectively. The response time is interval between the 10% and 90% (1 frame at 60 Hz) of amplitudes.

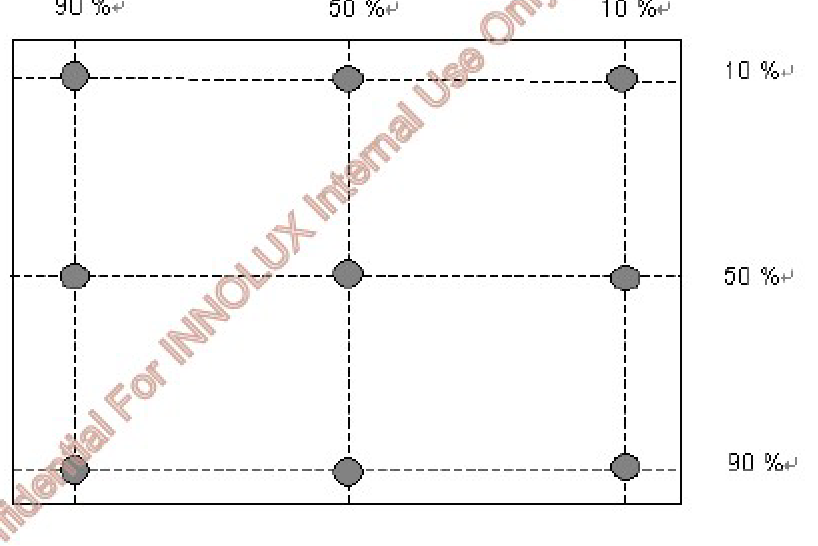


$Tr_R + Tf_F$ = 5 msec (typ.).

Note 5: **Color chromaticity and coordinates (CIE) is** measured by TOPCON SR-3

Note 6**: Central luminance is** measured by TOPCON SR-3

Note 7: **Luminance uniformity of these 9 points is defined as below and** measured by TOPCON SR-3



$$\text{Uniformity} = \frac{\text{Minimum Luminance in 9 points (1-9)}}{\text{Maximum Luminance in 9 Points (1-9)}}$$

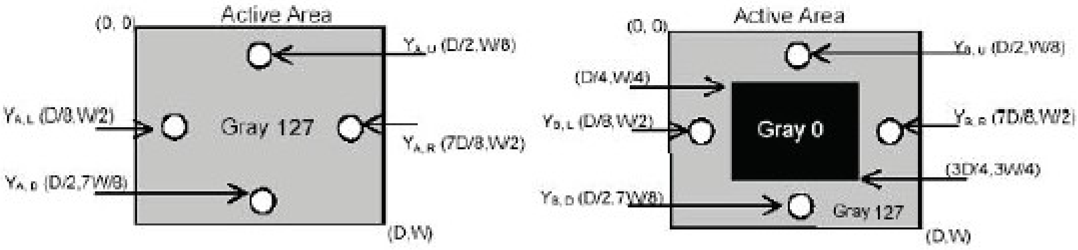
Note 8: **Crosstalk is defined as below and** measured by TOPCON SR-3

CT = | YB – YA | / YA × 100 (%)

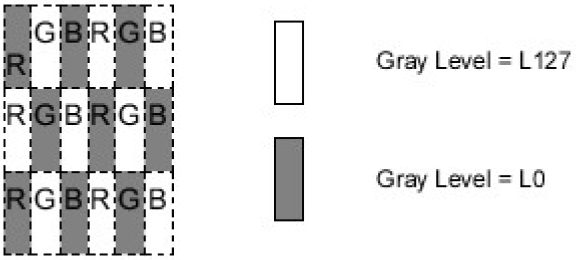
Where

YA = Luminance of measured location without gray level 0 pattern (cd/m2)

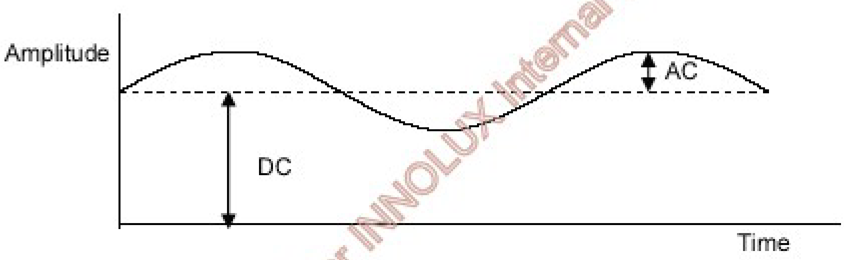
YB = Luminance of measured location with gray level 0 pattern (cd/m2)



Note 9: **Test Patern: Subchecker Pattern** measured by TOPCON SR-3



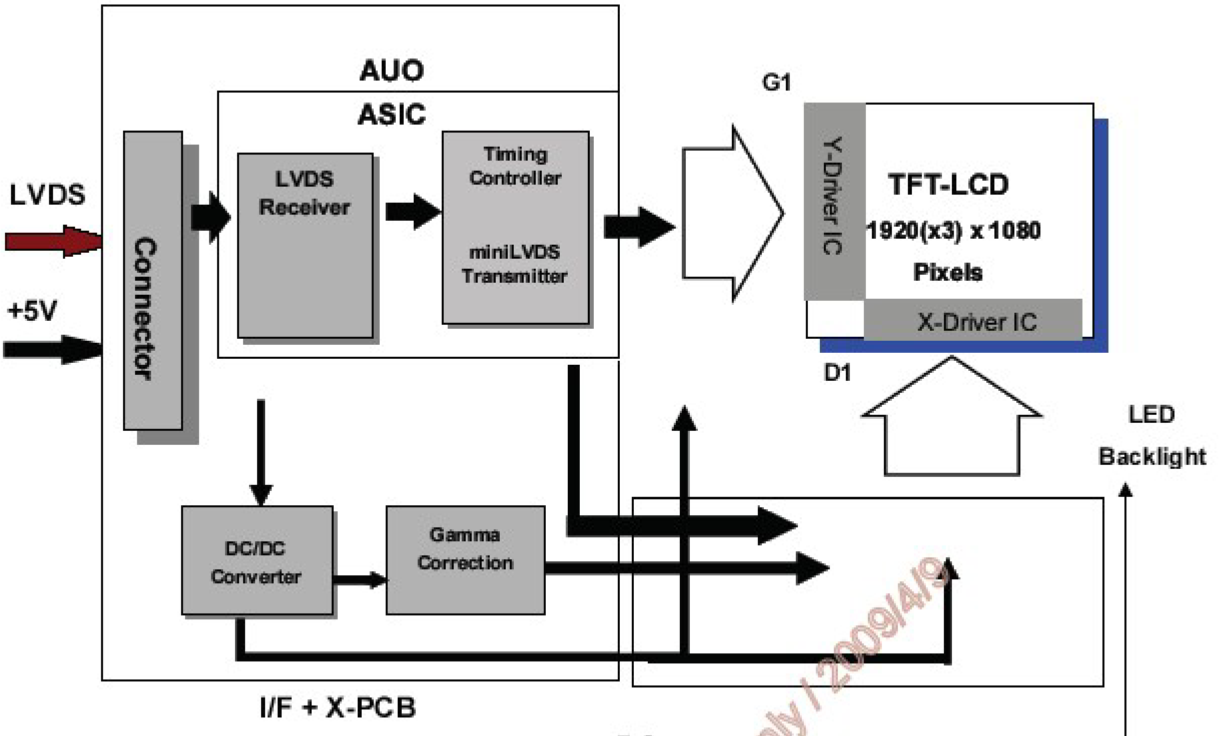
Method: Record dBV & DC value with TRD-100



$$\text{Flicker (dB)} = 20 \log \frac{\text{AC Level(at 30 Hz)}}{\text{DC Level}}$$

3.0 Functional Block Diagram

The following diagram shows the functional block of the 24.0 inch Color TFT-LCD Module:



I/F PCB Interface:
FI-XB30SRL-HF11
093F30-B0T01A

Mating Type:
FI-X30HL(Locked Type)

4.0 Absolute Maximum Ratings

Absolute maximum ratings of the module are as following:

4.1 TFT LCD Module

Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive Voltage	VDD	0	6.0	[Volt]	***Note 1,2***

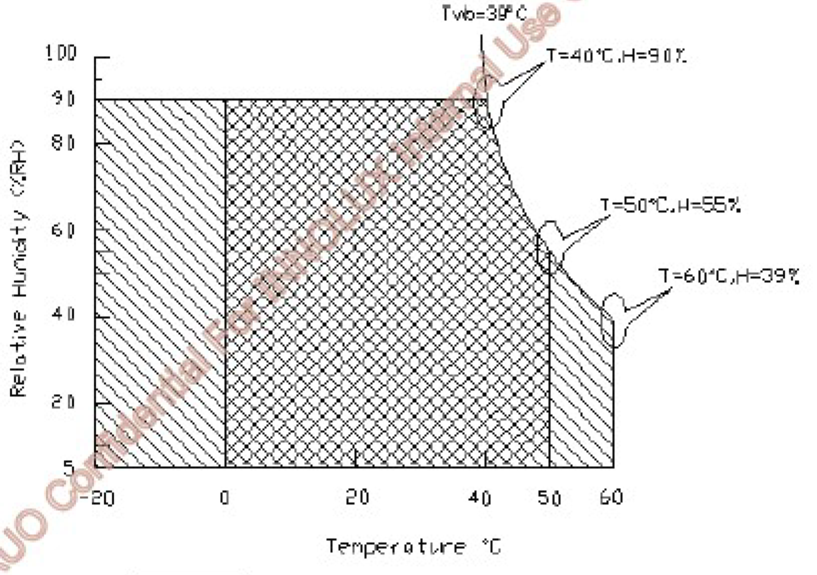
4.2 Backlight Unit

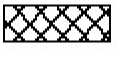
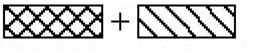
Item	Symbol	Min	Max	Unit	Conditions
LED Current	ILED	NA	20	[mA]	***Note 1,2***

4.3 Absolute Ratings of Environment

Item	Symbol	Min.	Max.	Unit	Conditions
Operating Temperature	TOP	0	+50	[°C]	***Note 3***
Operation Humidity	HOP	5	90	[%RH]	
Storage Temperature	TST	-20	+60	[°C]	
Storage Humidity	HST	5	90	[%RH]	

Note 1: With in Ta (25℃)
Note 2: Permanent damage to the device may occur if exceeding maximum values
Note 3: For quality perfermance, please refer to AUO IIS(Incoming Inspection Standard).



Operating Range  Storage Range 

5.0 Electrical characteristics

5.1 TFT LCD Module

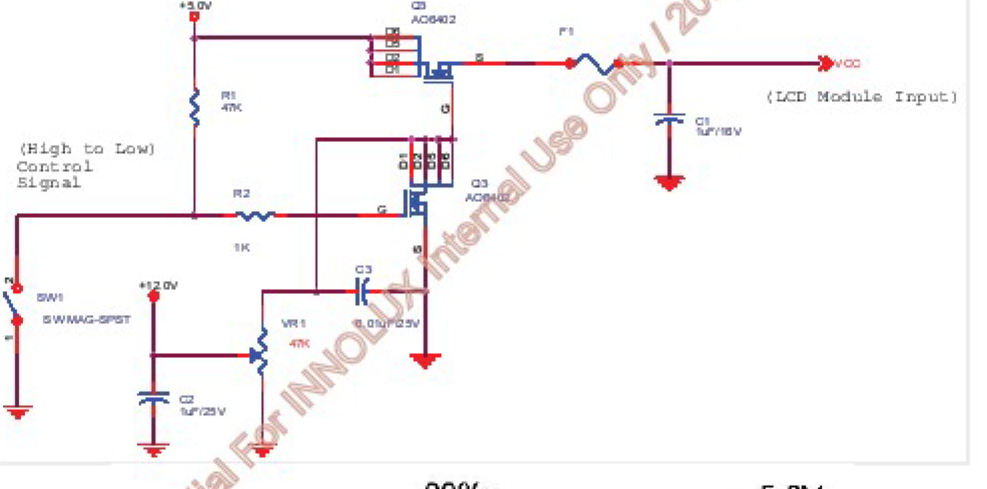
5.1.1 Power Specification

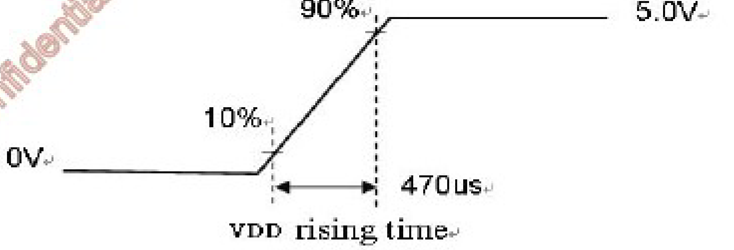
Input power specifications are as following:

Symbol	Parameter	Min	Typ	Max	Unit	Conditions
VDD	Logic/LCD Drive Voltage	4.5	5.0	5.5	[Volt]	+/-10%
IDD	Input Current	-	TBD	TBD	[A]	VDD= 5.0V, All Black Pattern At 75Hz, +30%
PDD	VDD Power	-	TBD	TBD	[Watt]	VDD= 5.0V, All Black Pattern At 75Hz
IRush	Inrush Current	-	-	TBD	[A]	**Note 1**
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	300	[mV] p-p	VDD= 5.0V, All Black Pattern At 75Hz

Note 1: Measurement conditions:

The duration of rising time of power input is 470us.





VDD rising time

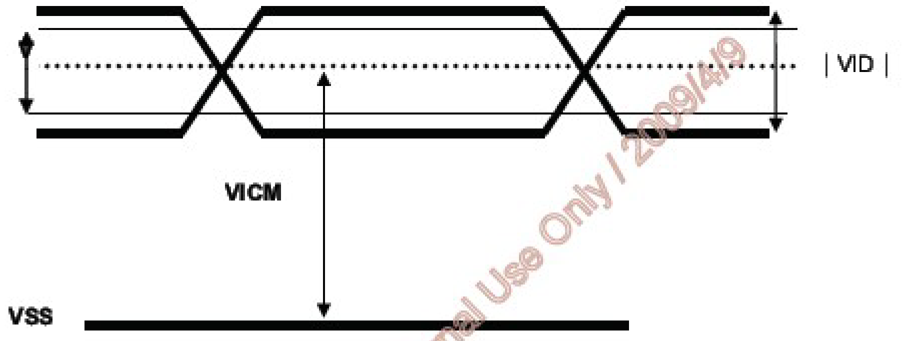
5.1.2 Signal Electrical Characteristics

Input signals shall be low or Hi-Z state when VDD is off. Please refer to specifications of SN75LVDS82DGG (Texas Instruments) in detail.

Characteristics of each signal are as following:

Symbol	Parameter	Min	Typ	Max	Units	Condition
VTH	Differential Input High Threshold	-	+50	+100	[mV]	VICM = 1.2V ***Note 1***
VTL	Differential Input Low Threshold	-100	-50	-	[mV]	VICM = 1.2V ***Note 1***
│VID│	Input Differential Voltage	100	-	600	[mV]	***Note 1***
VICM	Differential Input Common Mode Voltage	+1.0	+1.2	+1.5	[V]	VTH-VTL = 200MV (max) ***Note 1***

Note 1: LVDS Signal Waveform



5.2 Backlight Unit

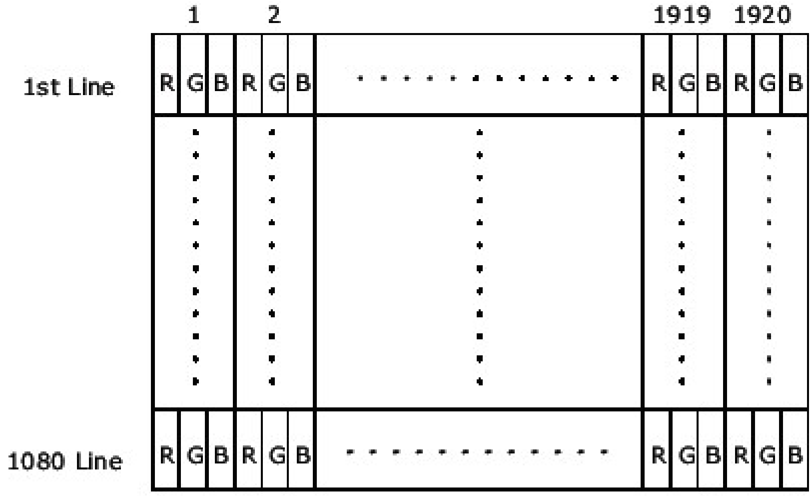
Parameter guideline for LED driving is under stable conditions at 25℃ (Room Temperature):

Symbol	Parameter	Min.	Typ.	Max.	Unit	Note
IR_{LED}	LED Operation Current	-	20	20	[mA]	**Operating with fixed driving current**
V_{LB}	Light Bar Operation Voltage (for reference)	-	42.9	44.2	[Volt]	
P_{BLU}	BLU Power consumption (for reference)	-	13.73	14.14	[Watt]	
LT_{LED}	LED life Time	-	15,000	-	[Hour]	

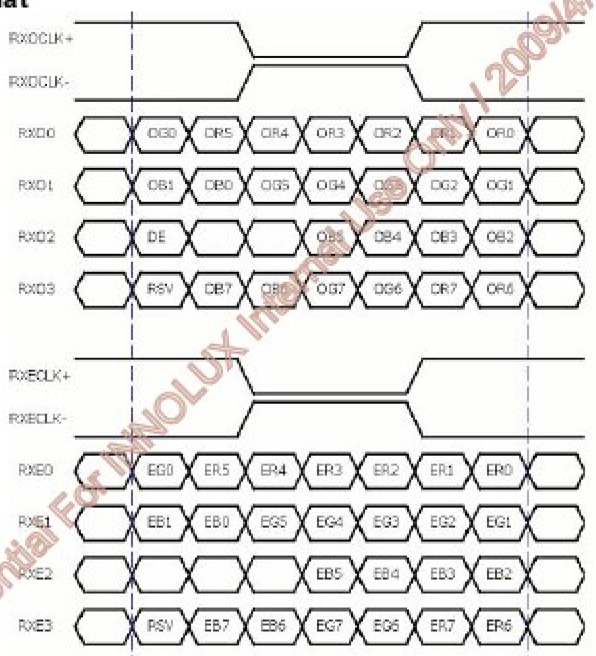
6.0 Signal Characteristic

6.1 Pixel Format Image

Following figure shows the relationship of the input signals and LCD pixel format.



6.2 The input data format



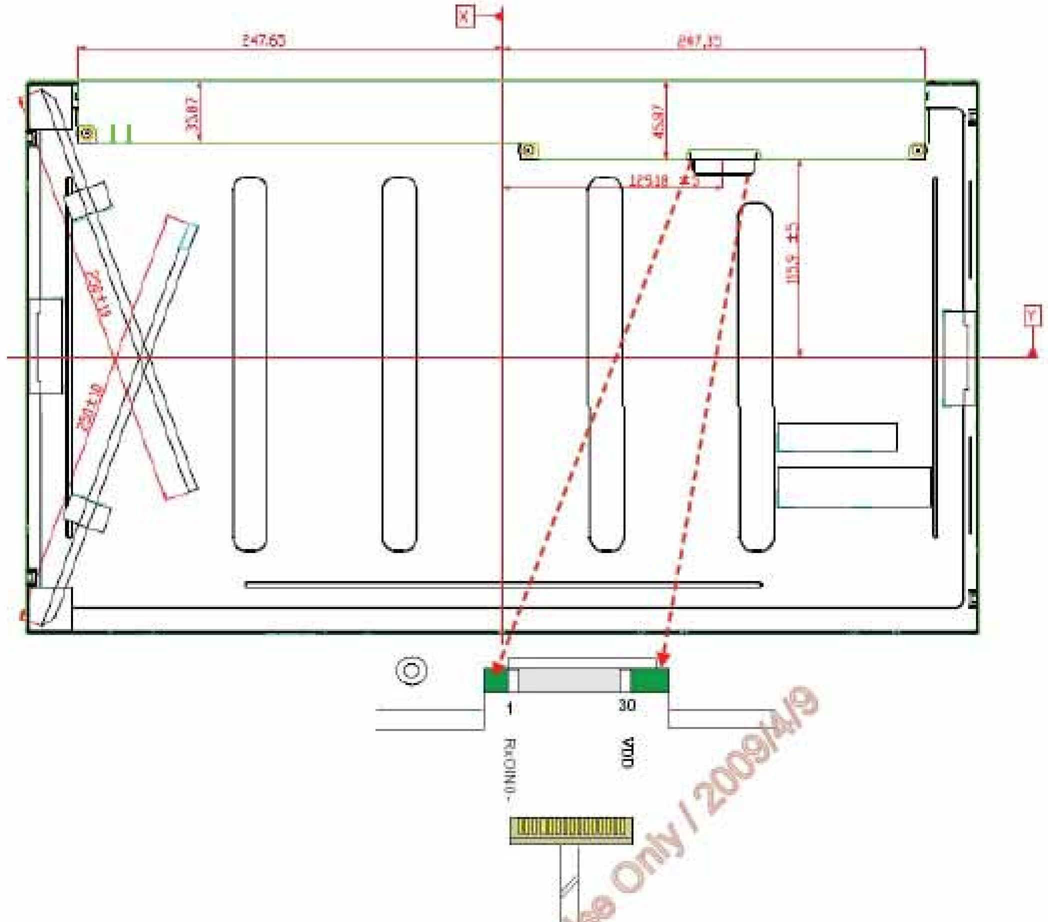
Note 1: R/G/B data 7:MSB, R/G/B data 0:LSB O = "Odd Pixel Data" E = "Even Pixel Data"

6.3 Signal Description

The module using one LVDS receiver SN75LVDS82(Texas Instruments). LVDS is a differential signal technology for LCD interface and high speed data transfer device. LVDS transmitters shall be SN75LVDS83(negative edge sampling). The first LVDS port(RxOxxx) transmits odd pixels while the second LVDS port(RxExxx) transmits even pixels.

PIN #	SIGNAL NAME	DESCRIPTION
1	RxOIN0-	Negative LVDS differential data input (Odd data)
2	RxOIN0+	Positive LVDS differential data input (Odd data)
3	RxOIN1-	Negative LVDS differential data input (Odd data)
4	RxOIN1+	Positive LVDS differential data input (Odd data)
5	RxOIN2-	Negative LVDS differential data input (Odd data, DSPTMG)
6	RxOIN2+	Positive LVDS differential data input (Odd data, DSPTMG)
7	GND	Power Ground
8	RxOCLK-	Negative LVDS differential clock input (Odd clock)
9	RxOCLK+	Positive LVDS differential clock input (Odd clock)
10	RxOIN3-	Negative LVDS differential data input (Odd data)
11	RxOIN3+	Positive LVDS differential data input (Odd data)
12	RxEIN0-	Negative LVDS differential data input (Even data)
13	RxEIN0+	Positive LVDS differential data input (Even data)
14	GND	Power Ground
15	RxEIN1-	Positive LVDS differential data input (Even data)
16	RxEIN1+	Negative LVDS differential data input (Even data)
17	GND	Power Ground
18	RxEIN2-	Negative LVDS differential data input (Even data)
19	RxEIN2+	Positive LVDS differential data input (Even data)
20	RxECLK-	Negative LVDS differential clock input (Even clock)
21	RxECLK+	Positive LVDS differential clock input (Even clock)
22	RxEIN3-	Negative LVDS differential data input (Even data)
23	RxEIN3+	Positive LVDS differential data input (Even data)
24	GND	Power Ground
25	NC	No connection (for AUO test only. Do not connect)
26	NC	No connection (for AUO test only. Do not connect)
27	VDD	Power +5V
28	VDD	Power +5V
29	VDD	Power +5V
30	VDD	Power +5V

Note1: Start from left side



Note2: Input signals of odd and even clock shall be the same timing.

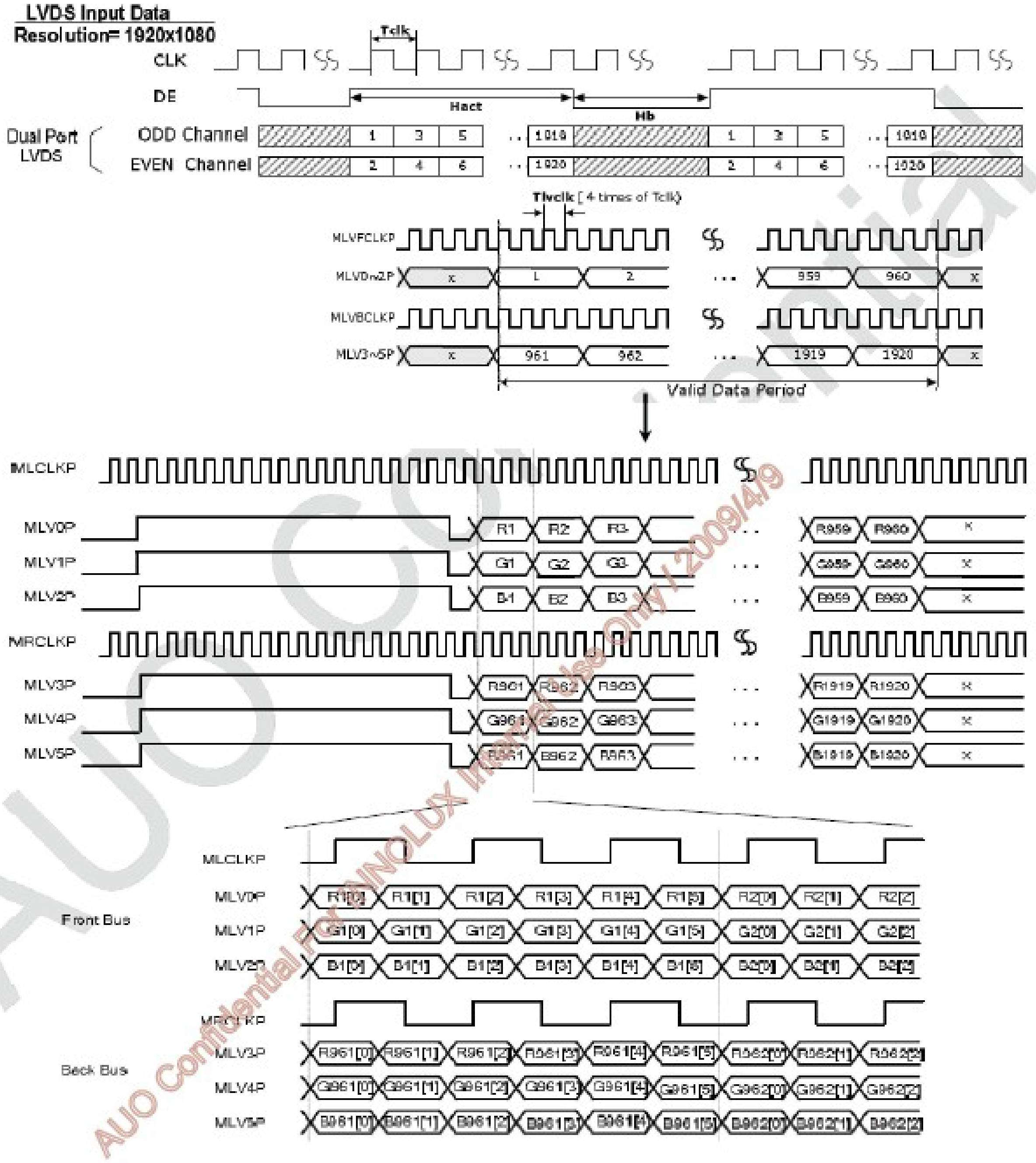
6.4 Timing Characteristics

Basically, interface timing described here is not actual input timing of LCD module but close to output timing of SN75LVDS82DGG (Texas Instruments) or equivalent.

Item		Symbol	Min	Typ	Max	Unit
Data CLK		Tclk	40	75	90	[MHz]
H-section	Period	Th	1034	1060	2047	[Tclk]
	Display Area	Tdisp(h)	960	960	960	[Tclk]
	Blanking	Tblk(h)	74	100	1087	[Tclk]
V-section	Period	Tv	1088	1120	2047	[Th]
	Display Area	Tdisp(v)	1080	1080	1080	[Th]
	Blanking	Tblk(v)	8	40	967	[Th]
Frame Rate		F	50	60	75	[Hz]

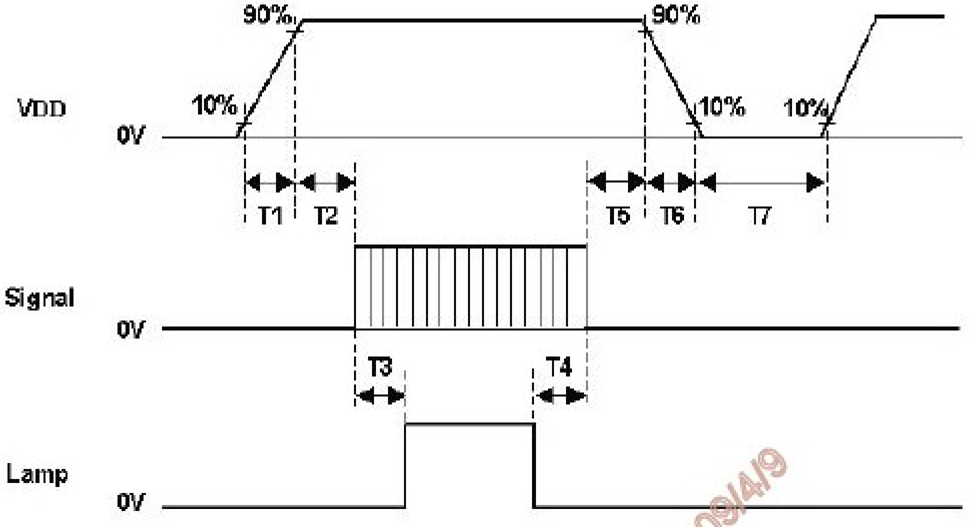
Note : DE mode only

6.5 Timing diagram



6.6 Power ON/OFF Sequence

VDD power and lamp on/off sequence are as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi-Z state or low level when VDD is off.



Parameter	Value			Unit
	Min.	Typ.	Max.	
T1	TBD		TBD	[msec]
T2	TBD	-	TBD	[msec]
T3	TBD	-	-	[msec]
T4	TBD	-	-	[msec]
T5	TBD	TBD	TBD	[msec]
T6	-	-	TBD	[msec]
T7	TBD	-	-	[msec]

7.0 Connector & Pin Assignment

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

7.1 TFT LCD Module

Connector Name / Designation	Interface Connector / Interface card
Manufacturer	JAE Starconn
Type Part Number	FI-XB30SRL-HF11 093F30-B0T01A
Mating Housing Part Number	FI-X30HL (Locked Type)

7.1.1 Pin Assignment

Pin#	Signal Name	Pin#	Signal Name
1	RxOIN0-	2	RxOIN0+
3	RxOIN1-	4	RxOIN1+
5	RxOIN2-	6	RxOIN2+
7	GND	8	RxOCLKIN-
9	RxOCLKIN+	10	RxOIN3-
11	RxOIN3+	12	RxEIN0-
13	RxEIN0+	14	GND
15	RxEIN1-	16	RxEIN1+
17	GND	18	RxEIN2-
19	RxEIN2+	20	RxECLKIN-
21	RxECLKIN+	22	RxEIN3-
23	RxEIN3+	24	GND
25	NC (for AUO test only. Do not connect)	26	NC (for AUO test only. Do not connect)
27	VDD	28	VDD
29	VDD	30	VDD

7.2 Recommend connector for Backlight Unit

This connector is mounted on the monitor system board for LED light-bar FFC mating.

Connector Name / Designation	Driver Board Connector
Manufacturer	ENTERY INDUSTRIAL CO., LTD
Mating Type Part Number	6712K-F10N-02R

7.2.1 Pin assignment

Pin no.	Signal name
1	IRLED (current out)
2	IRLED (current out)
3	IRLED (current out)
4	IRLED (current out)
5	VLED (voltage in)
6	VLED (voltage in)
7	IRLED (current out)
8	IRLED (current out)
9	IRLED (current out)
10	IRLED (current out)

8.0 Reliability Test

Environment test conditions are listed as following table.

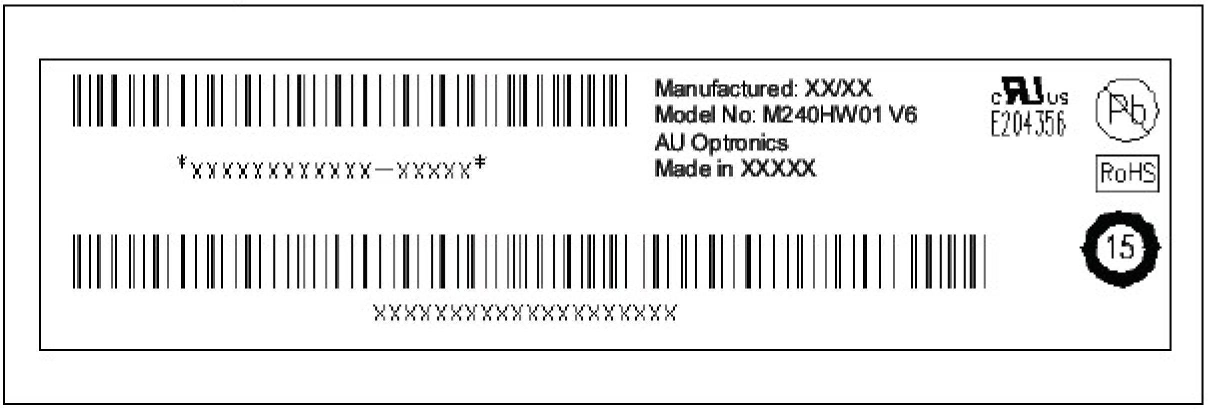
Items	Required Condition	Note
Temperature Humidity Bias (THB)	Ta= 50℃, 80%RH, 300hours	
High Temperature Operation (HTO)	Ta= 50℃, 50%RH, 300hours	
Low Temperature Operation (LTO)	Ta= 0℃, 300hours	
High Temperature Storage (HTS)	Ta= 60℃, 300hours	
Low Temperature Storage (LTS)	Ta= -20℃, 300hours	
Vibration Test (Non-operation)	Acceleration: 1.5 Grms Wave: Random Frequency: 10 - 200 Hz Duration: 30 Minutes each Axis (X, Y, Z)	
Shock Test (Non-operation)	Acceleration: 50 G Wave: Half-sine Active Time: 20 ms Direction: ±X, ±Y, ±Z (one time for each Axis)	
Drop Test	Height: 46 cm, package test	
Thermal Shock Test (TST)	-20℃/30min, 60℃/30min, 100 cycles	*1*
On/Off Test	On/10sec, Off/10sec, 30,000 cycles	
ESD (Electro Static Discharge)	Contact Discharge: ± 8KV, 150pF(330Ω) 1sec, 15 points, 25 times/ point.	*2*
	Air Discharge: ± 15KV, 150pF(330Ω) 1sec 15 points, 25 times/ point.	
Altitude Test	Operation:10,000 ft Non-Operation:30,000 ft	

Note 1: The TFT-LCD module will not sustain damage after being subjected to 100 cycles of rapid temperature change. A cycle of rapid temperature change consists of varying the temperature from -20℃ to 60℃, and back again. Power is not applied during the test. After temperature cycling, the unit is placed in normal room ambient for at least 4 hours before power on.

Note 2: EN61000-4-2, ESD class B: Certain performance degradation allowed
No data lost
Self-recoverable
No hardware failures.

9.0 Shipping Label

The label is on the panel as shown below:



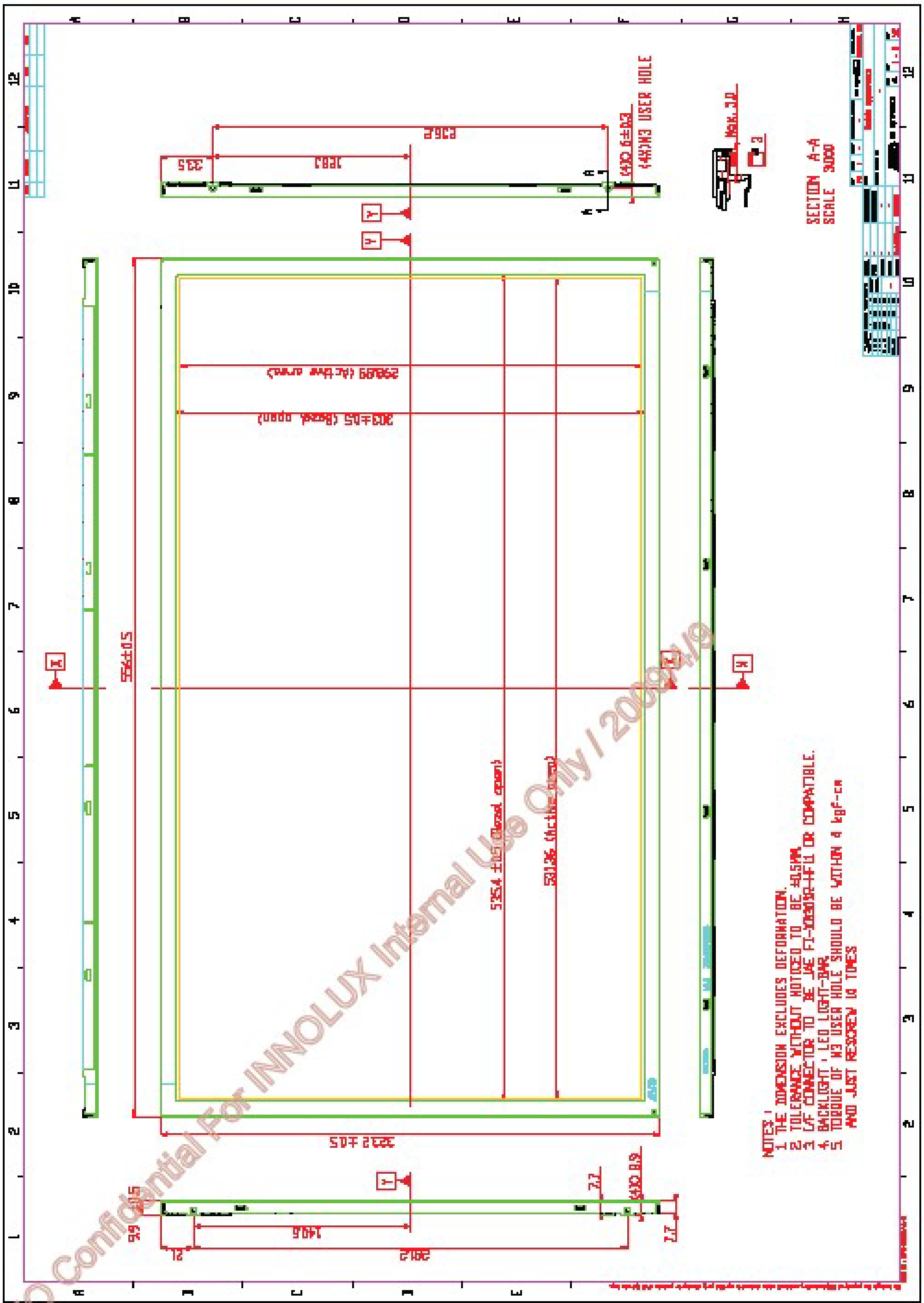
Note 1: For Pb Free products, AUO will add for identification.

Note 2: For RoHS compatible products, AUO will add for identification.

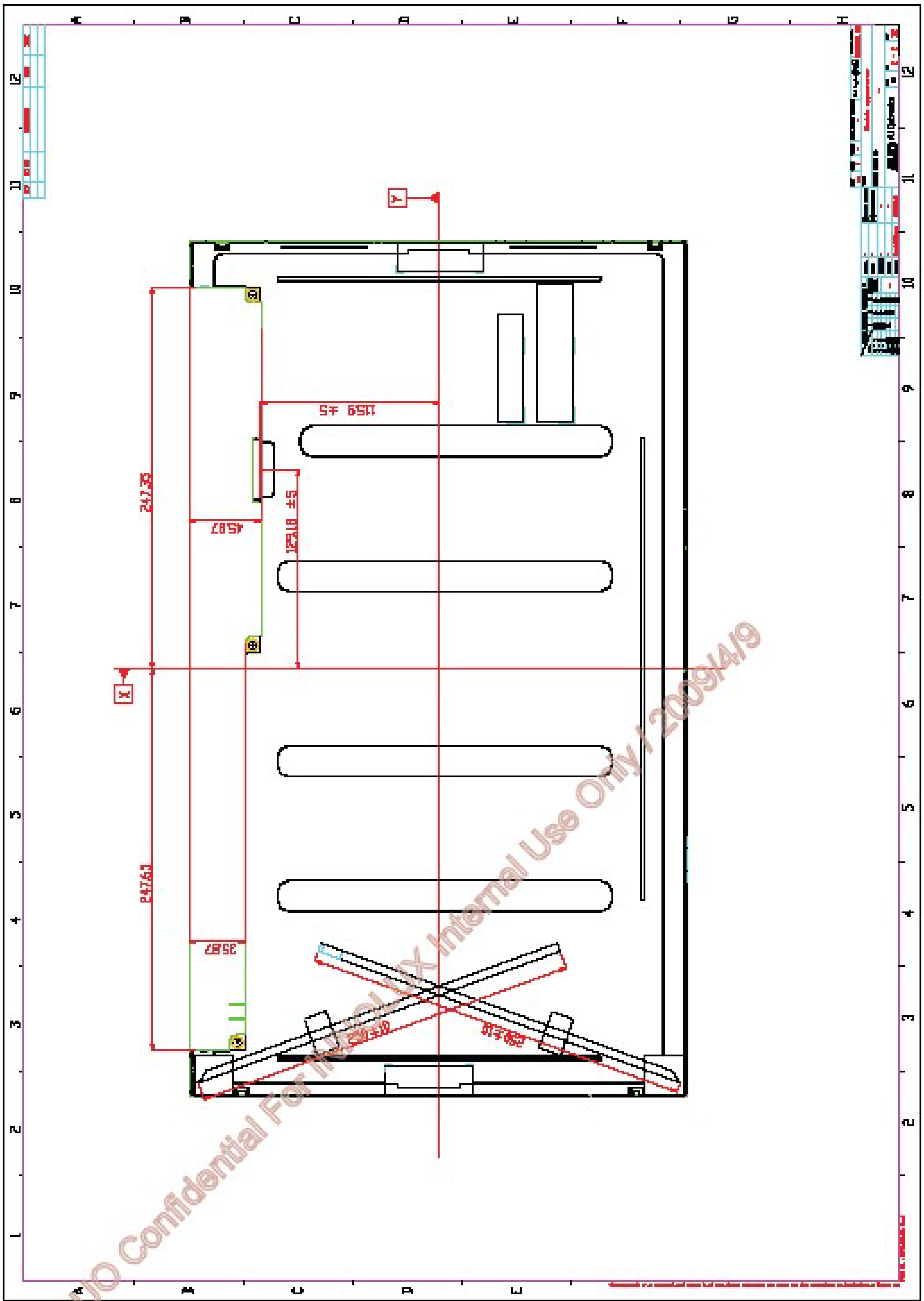
Note 3: For China RoHS compatible products, AUO will add for identification.

Note 4: The Green Mark will be presented only when the green documents have been ready by AUO Internal Green Team.

10.0 Mechanical Characteristics



Ver 1.0



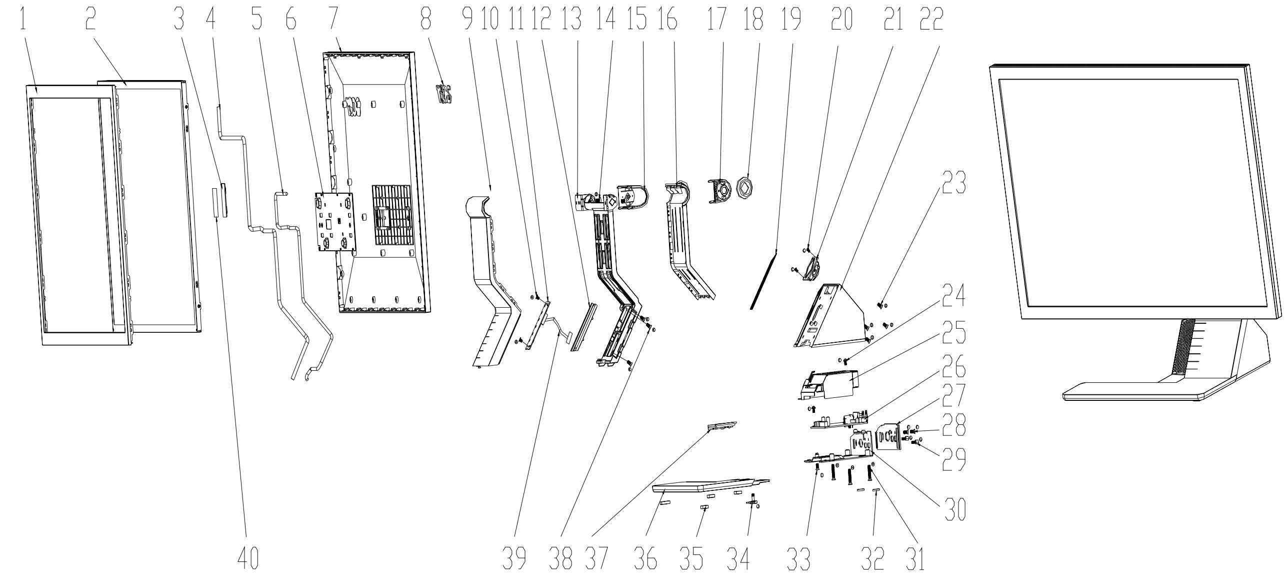
Ver 1.0

03 Exploded Diagram

3.1 LP2479(S243HL)_SCREW_LIST

Item	Part No.	Description	Qua，y(pcs)	Remark
1	509146306200R	SCREW,P,CROSS,W/ WAS,M3*6,Zn-Cc	2	I/F Board&CHASSIS
2	509000000700R	BOLT,#4-40x11.8,Ni	4	D-SUB*2
3	509216306300R	SCREW,F,CROSS,M3 *6,BLK,Zn,ROHS	2	HDMI CONNECTOR*2
4	509212608120R	SCREW,F,CROSS,T4 *8,Zn,ROHS(5.8~6.2)	4	STAND FRONT&DIE CASTING*3 BASE PLATE&BASE BOX*1
5	509016306200R	SCREW,I,CROSS,M3 *6	2	KEYPAD
6	509216608510R	SCREW,F,CROSS,M4 *8,BLACK,NL,ROHS (NYLOK)	3	HINGE&HINGE BRACKET
7	509216606520R	SCREW,F,CROSS,M4 *6.0,BLK-NL ROHS(NYLOK)	4	BOX&DIE CASTING
8	509012306801R	SCREW,F,CROSS,T4 *17,Zn,ROHS(6.0~6.5)	3	BASE PLATE&BASE BOX
9	509413308500R	SCREW,B,CROSS,T3 *8 BLK	2	SPEAKER&BOX

3.2. LCD Exploded drawing (All)



ITEM	PART NUMBER	DISCRIPTION	Q'TY
41			
40	506380203300R	TAPE,ADHENSIVE,TRANSITION PCB,LP2479	1
39		HRN ,KEYPAD	1
38	509212608120R	SCREW,F,CROSS,T4*8,Zn,ROHS(5.8~6.2)	3
37	501020223550R	COVER,BASE,BLACK,LP2479	1
36	502020500700R	BASE,SILVER,SILK,LP2479	1
35	503020006300R	RUBBER FOOT L14.8*W9.6*T3.5mm	1
34	509012306800R	SCREW,M4*9,Zn (WITH MANUAL),LP2479	1
33	509212608120R	SCREW,F,CROSS,T4*8,Zn,ROHS(5.8~6.2)	1
32	503020007500R	RUBBER FOOT ,D12*T2.0mm	1
31	509012306801R	SCREW,F,CROSS,T4*20,Zn,ROHS(6.0~6.5)	3
30	502020104501R	BASE PLATE,LP2479	1
29	509000000700R	BOLT,#4-40x11.8,Ni FOR D-SUB/DVI CONN.RO	2
28	509216306300R	SCREW,F,CROSS,M3*6,BLK,Zn,ROHS	2
27	714020027200R	ASSY,COVER,BOX,BLACK,LP2479	1
26	793761200700H	PCBA,I/F BOARD	1
25	502090320300R	CHASSIS,LP2479	1
24	509146306200R	SCREW,P,CROSS,W/WAS,M3*6,Zn-Cc	2
23	509216606520R	SCREW,F,CROSS,M4*6.0,BLK-NL ROHS(NYLOK)	4
22	501240219300R	BASE,BOX,BLACK,LP2479	1
21		SPEAKER,LP2479	1
20	509413308500R	SCREW,B,CROSS,T3*8 BLK	2
19	505040507900R	MESH,SPEAKER,LP2479	1
18	501020241102R	COVER HINGE,RING,SILVER,LP2479	2
17	501020241101R	COVER HINGE,BLACK,LEFT,LP2479	1
16	714000010600R	ASSY,STAND BACK,BLACK,LP2479	1
15	501020241100R	COVER HINGE,BLACK,RIGHT,LP2479	1
14	509216608510R	SCREW,F,CROSS,M4*8,BLACK,NL,ROHS(NYLOK)	3
13	714000010500R	ASSY,HINGE,DIE CASTING,LP2479	1
12	501120112100R	LENS,LP2479	1
11	793761500000H	PCBA,KEYPAD,LP2479	1
10	509016306200R	SCREW,I,CROSS,M3*6	2
9	750040100200R	SUB-ASSY,STAND FRONT,S,SILK,LP2479	1
8	501110203700R	ACER,LOGO,SILVER,LP2479	1
7	501020241103R	BACK,COVER,AUO,BLACK,LP2479	1
6	502020104500R	BRACKET,HINGE,LP2479	1
5		HRN,LAMP	1
4		HRN LVDS	1
3	793760500000H	PCBA,TRANSITION	1
2		Panel 24"	1
1	501014209900R	BEZEL,FRONT,BLACK,LP2479	1

Screw list LE21M4

ITEM	PART NUMBER	DISCRIPTION	Q'TY
J	509012306800R	SCREW,M4*9,Zn (WITH MANUAL),LP2479	3
I	509212608120R	SCREW,F,CROSS,T4*8,Zn,ROHS(5.8~6.2)	4
H	509012306801R	SCREW,F,CROSS,T4*20,Zn,ROHS(6.0~6.5)	3
G	509000000700R	BOLT,#4-40x11.8,Ni FOR D-SUB/DVI CONN.RO	2
F	509216306300R	SCREW,F,CROSS,M3*6,BLK,Zn,ROHS	2
E	509146306200R	SCREW,P,CROSS,W/WAS,M3*6,Zn-Cc	2
D	509216606520R	SCREW,F,CROSS,M4*6.0,BLK-NL ROHS(NYLOK)	4
C	509413308500R	SCREW,B,CROSS,T3*8 BLK	2
B	509216608510R	SCREW,F,CROSS,M4*8,BLACK,NL,ROHS(NYLOK)	3
A	509016306200R	SCREW,I,CROSS,M3*6	2

ZONE	REV	DESCRIPTION	DATE	APPROVED

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN MILLIMETERS.
DECIMALS: .X = .XX = ANGLES: .X = .XX =
MATL.
FINISH
SI - METRIC THIRD ANGLE PROJECTION

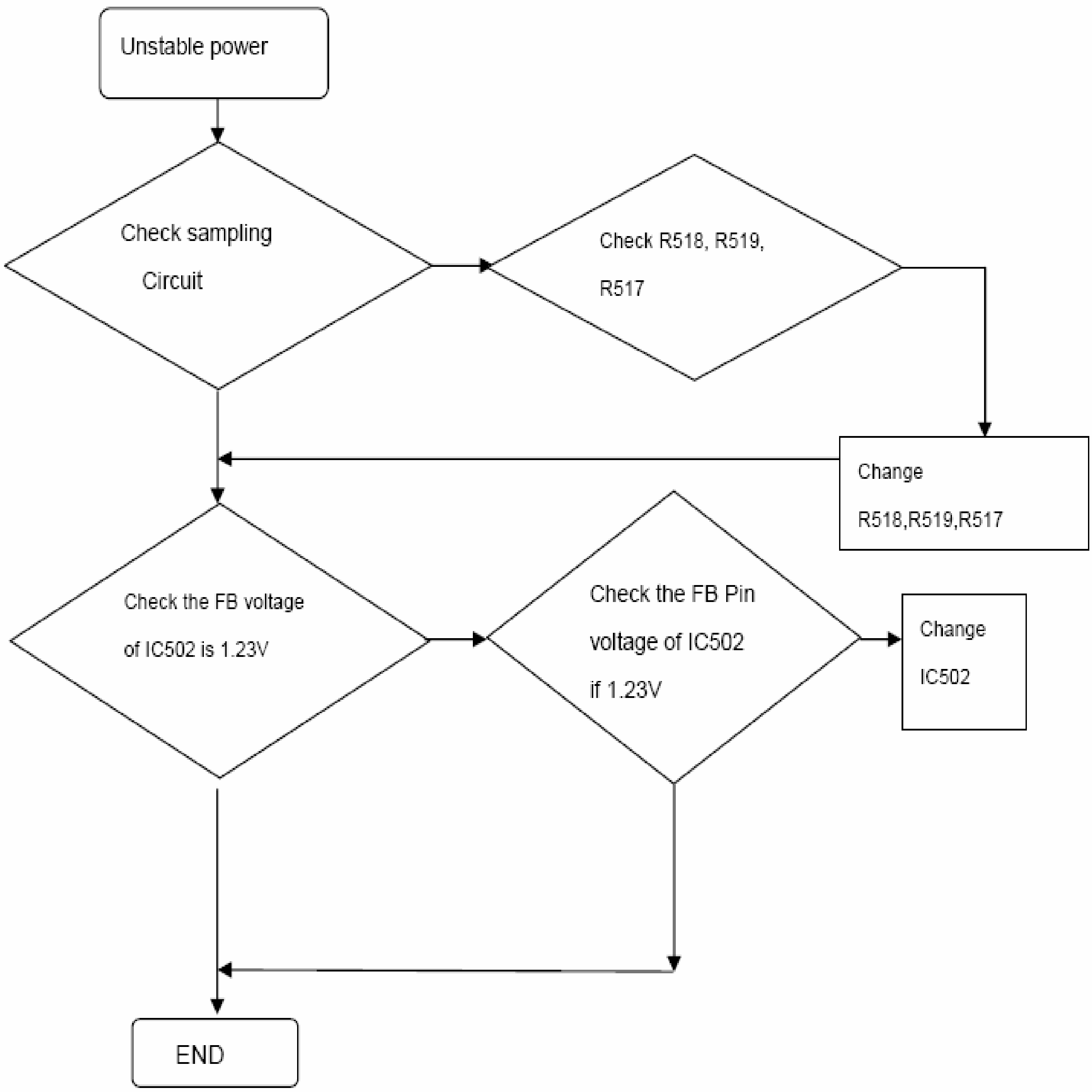
MODEL NO. LP2479(S243HL)
FOXCONN CORP. (INNOLUX)

SIGNATURE	DATE
DRAWN Summery Li	2009/6/9
CHK.	
ISSUED	

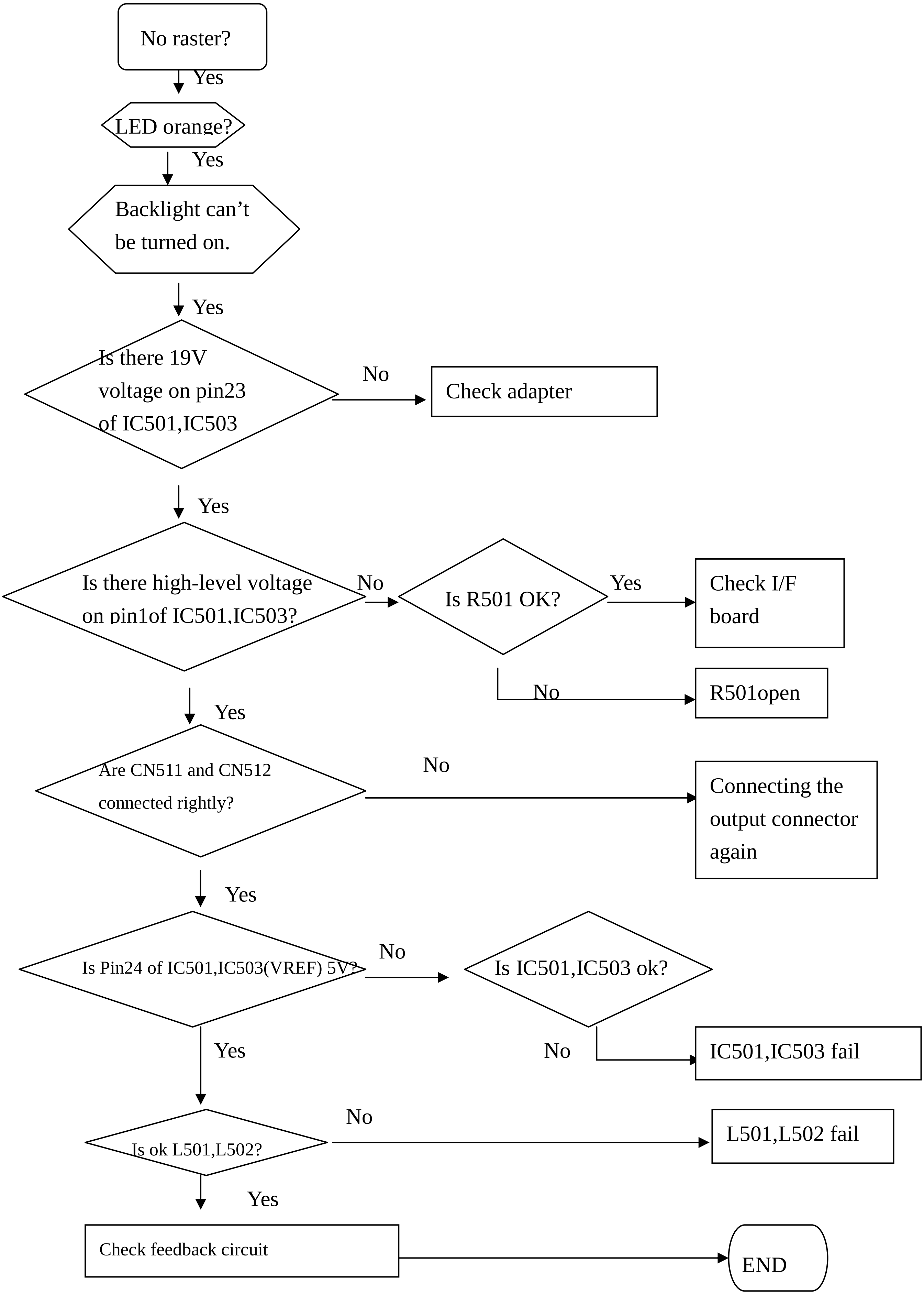
TITLE ASSY ,FINAL,LP2479(S243HL)
A1 PART NO. REV. A
SCALE: DWG NO. SHEET

04 Trouble shooting

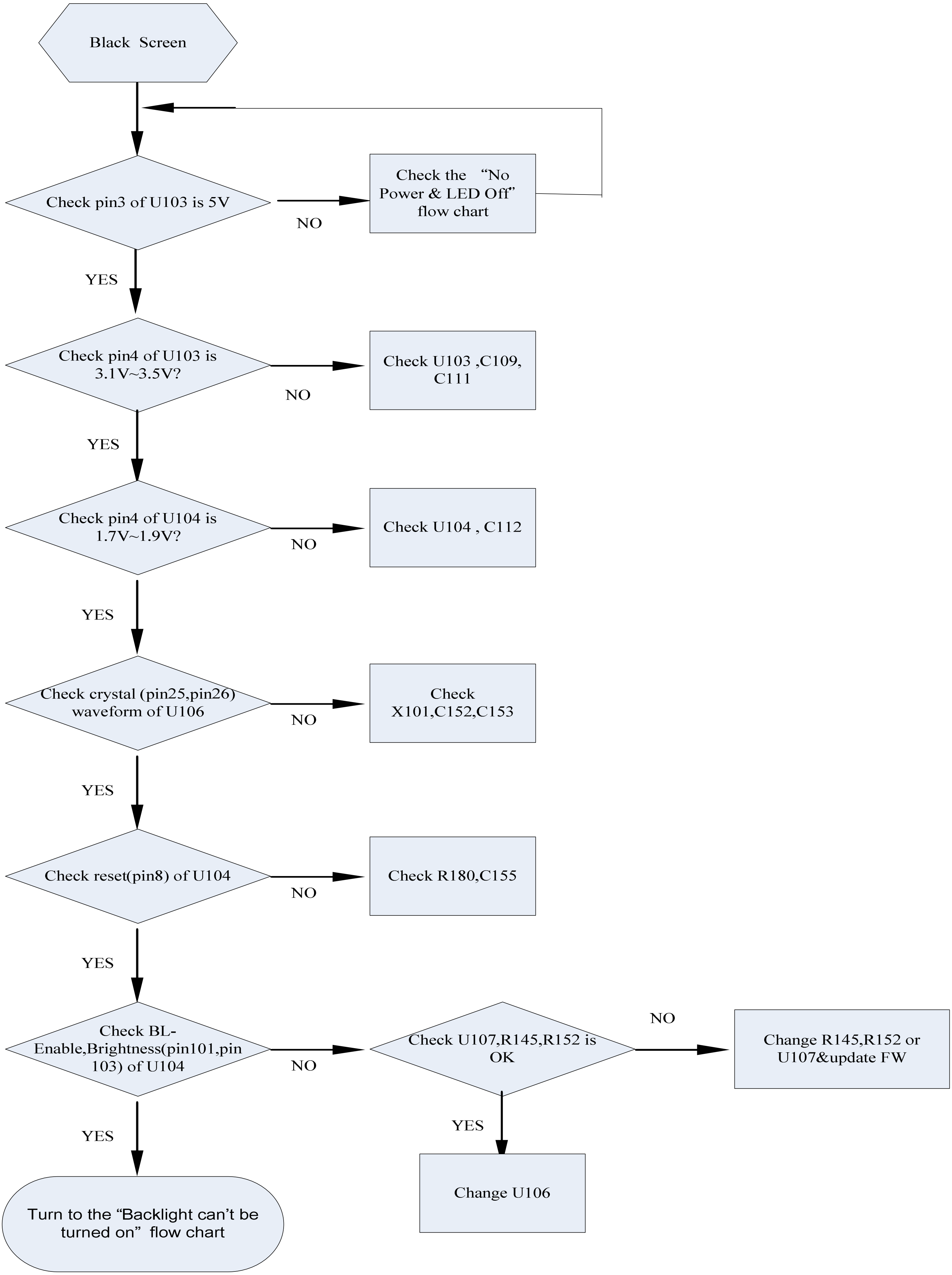
1. No Power & LED Off



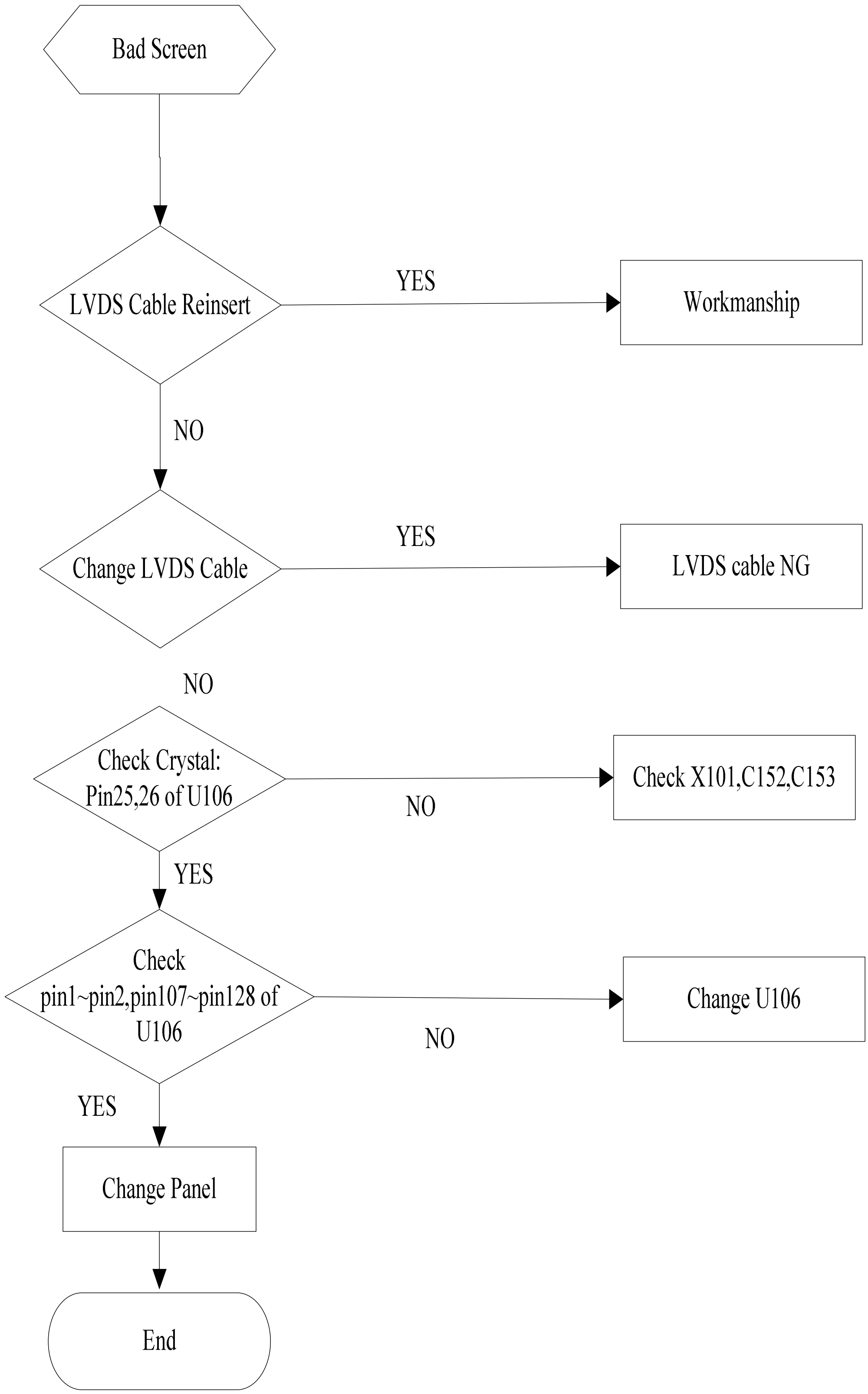
2. Backlight can't be turned on



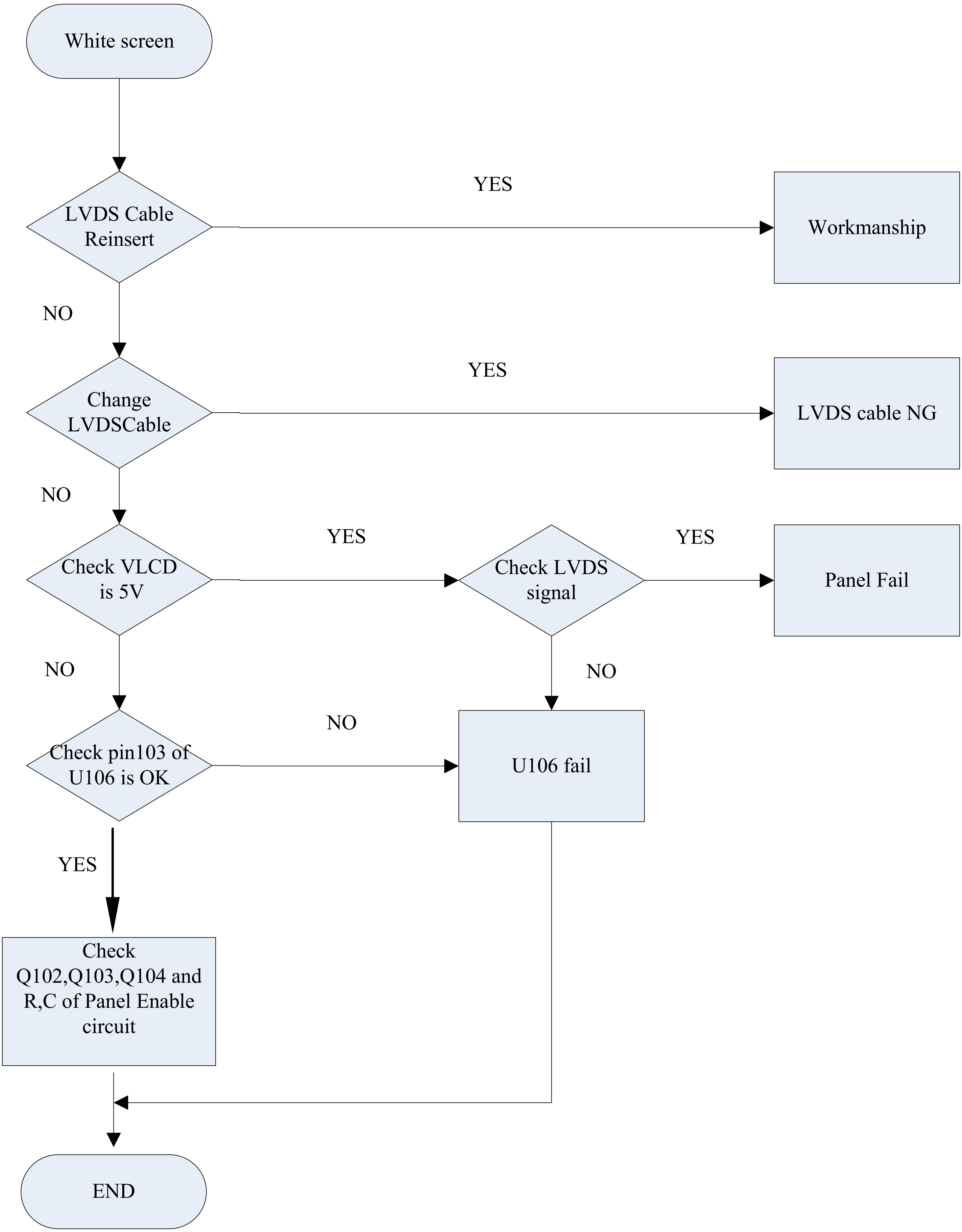
3.Black Screen



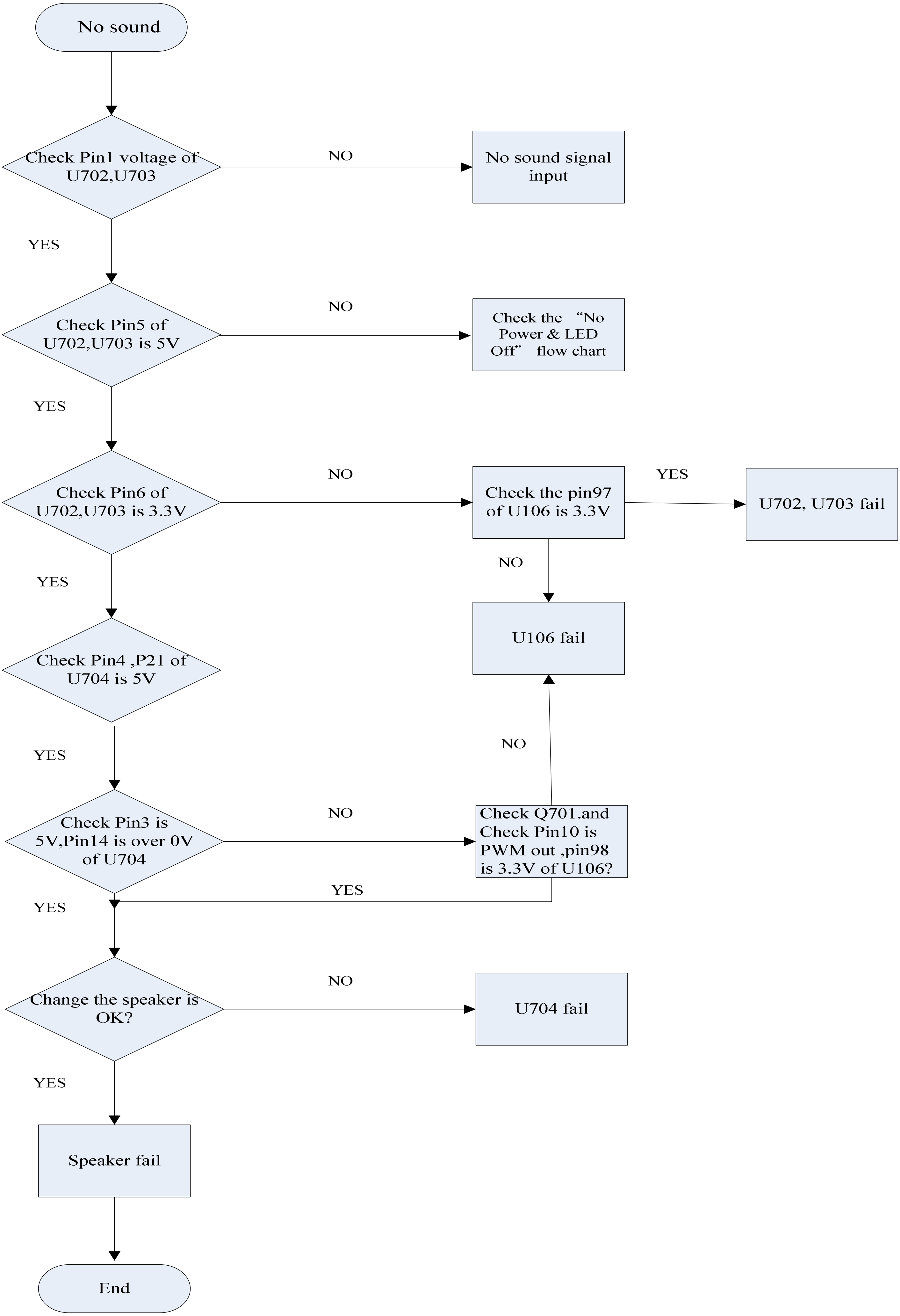
4.Bad Screen


Bad Screen
LVDS Cable Reinsert
YES
Workmanship
NO
Change LVDS Cable
YES
LVDS cable NG
NO
Check Crystal:
Pin25,26 of U106
NO
Check X101,C152,C153
YES
Check
pin1~pin2,pin107~pin128 of
U106
NO
Change U106
YES
Change Panel
End

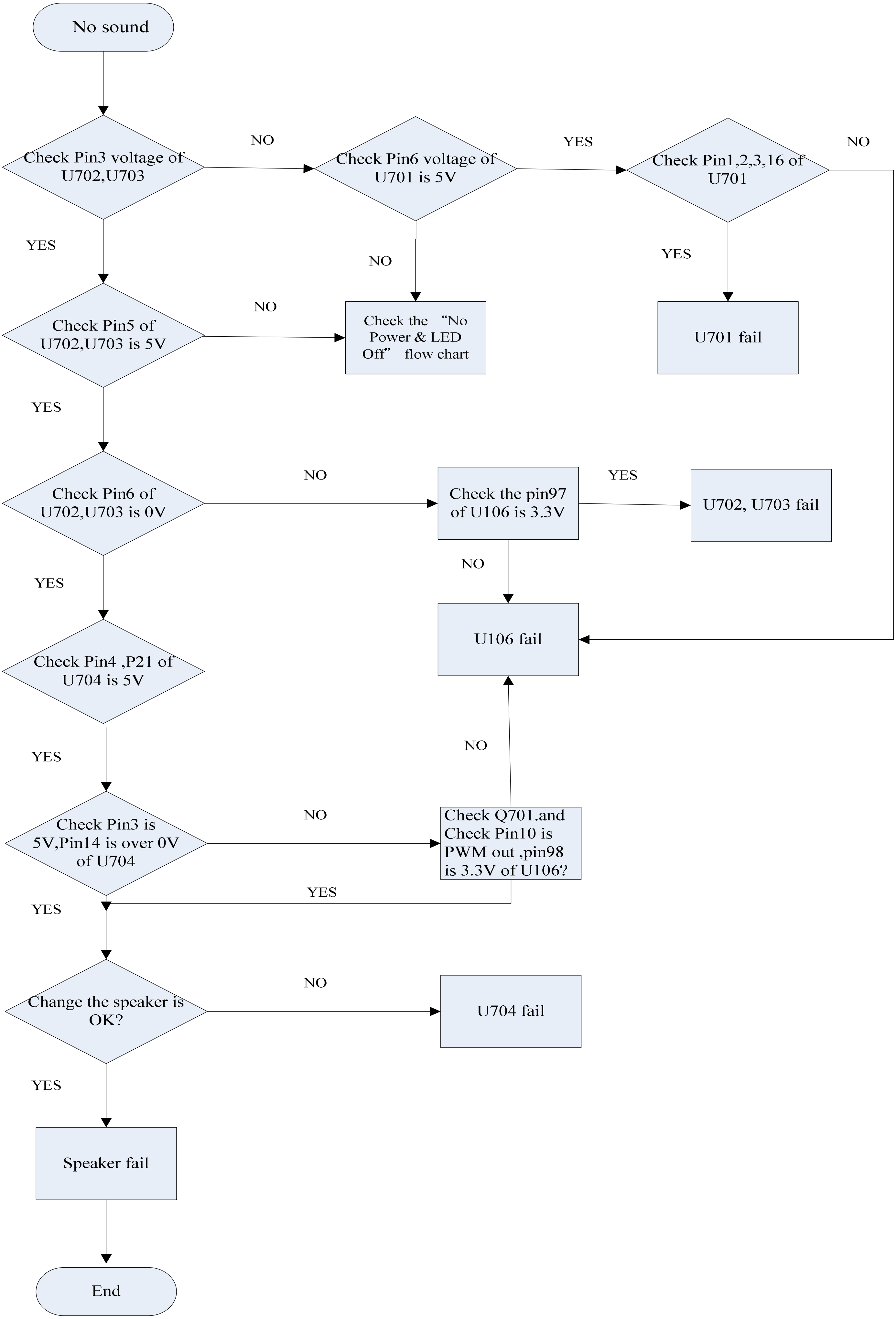
5.white screen



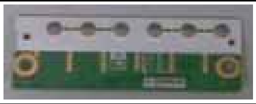
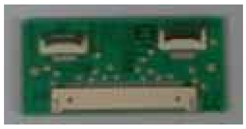
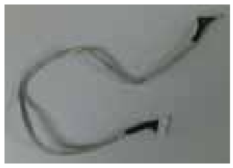
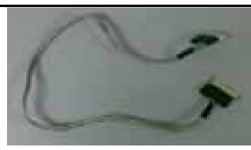
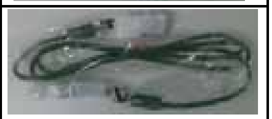
6. No volume with PC Audio Input



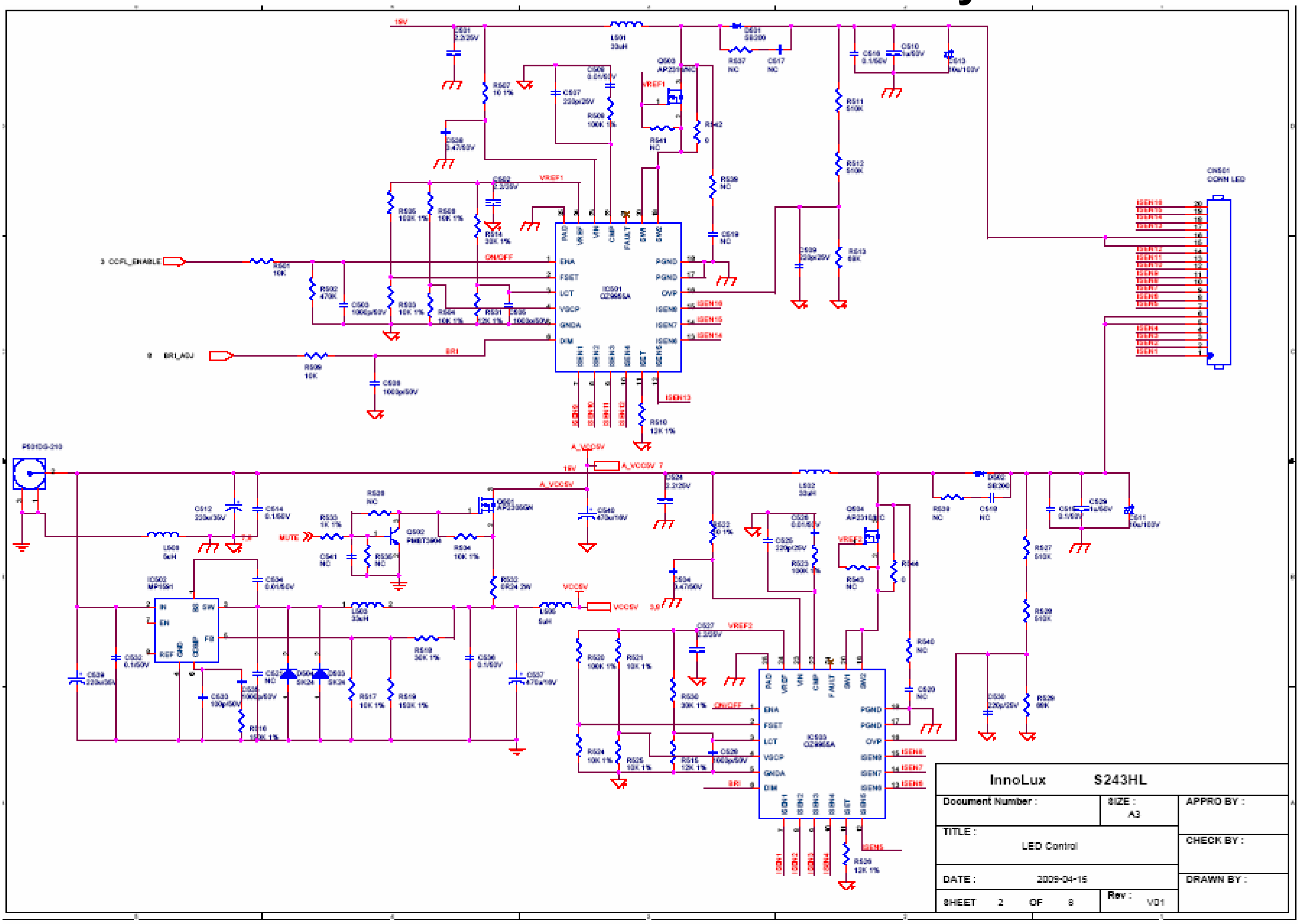
6. No volume with HDMI Input

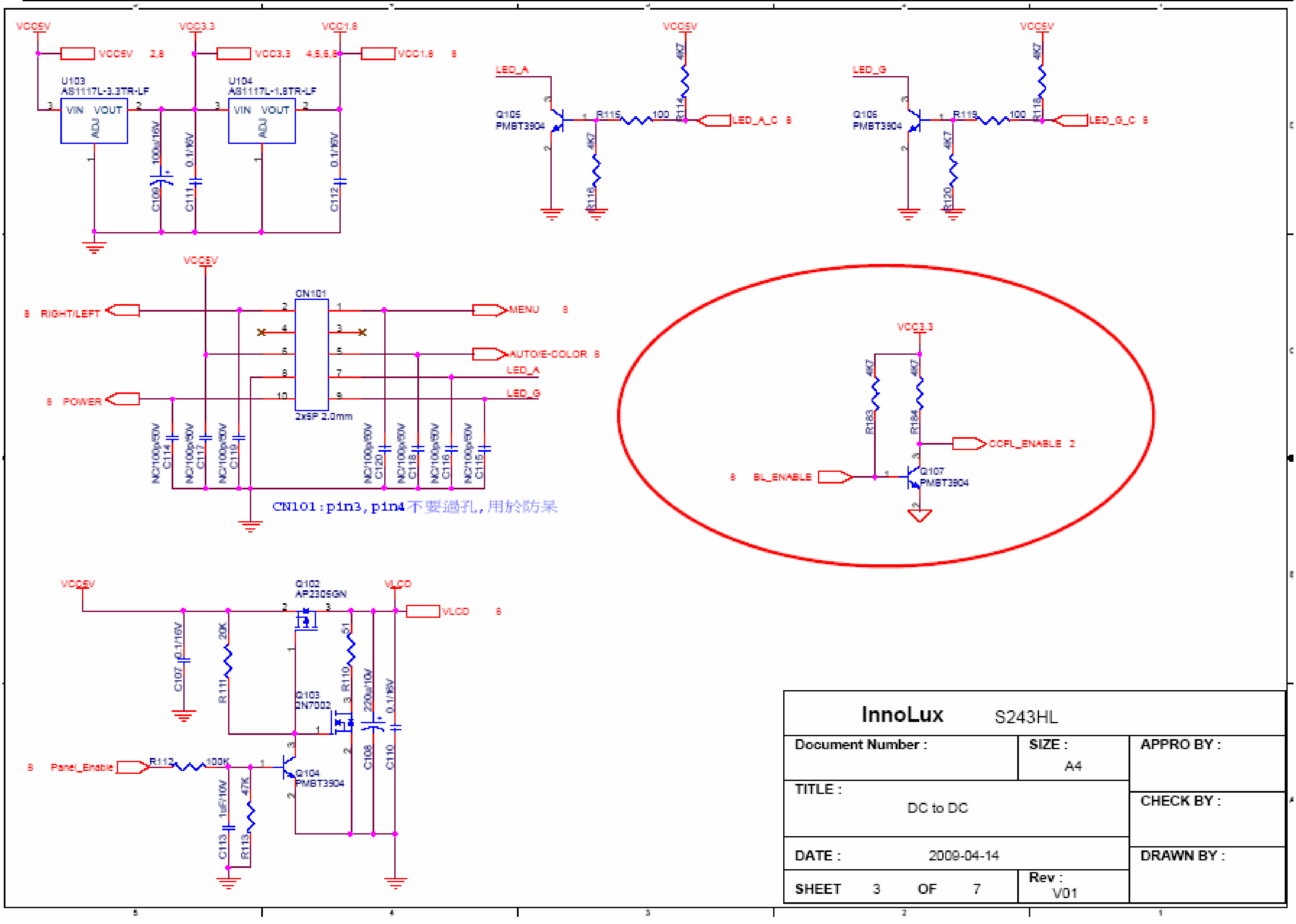


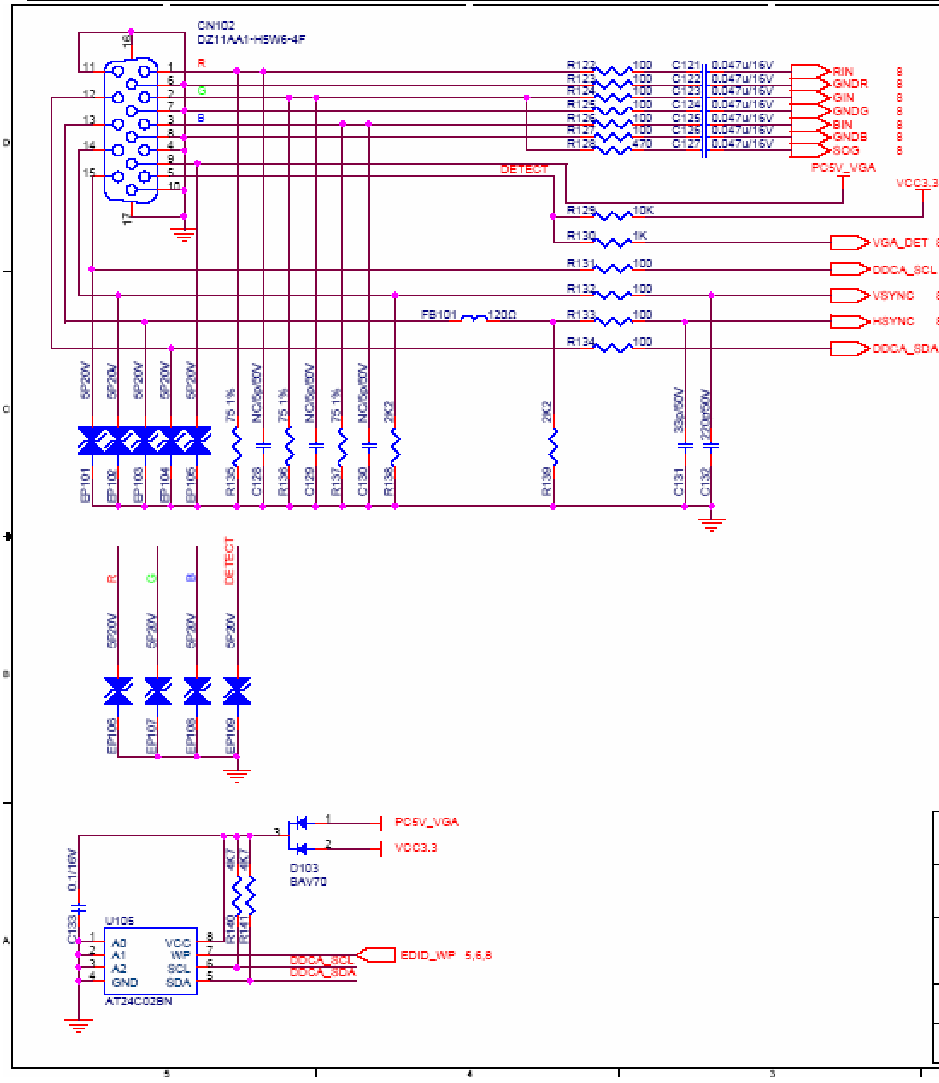
05 Spare Parts List

PARTNAME	ACER PART NO.	OEM PART NO	DESCRIPTION	82427972A120R CN
KEY BOARD	55.LH60J.002	793761500000H	PCBA,KEYPAD/B,LP2479-728	
MAIN BOARD	55.LH60J.001	793761200700H	PCBA,MAIN/B(A,EMEA,W/SPK),LP2479-728	
LED BOARD	55.LH60J.003	793760500000H	PCBA,LED/B,LP2479-728	
LCD	LK.24005.016	631102240320HA	LCP 24"M240HW01-V6-00(A)(AUO)HF	
LCD	LK.24005.017	631102240330HA	LCP 24"M240HW01-V6-0A(A)(AUO)HF	
LED CABLE	50.LH60J.001	430302000300H	HRN ASSY 2x10P To 1x20P 540mm UL3302#28	
FFC CABLE	50.LH60J.002	430303002920H	HRN ASS'Y LVDS 30P 625mm UL3302#28	
Keypad CABLE	50.LH60J.003	430301000480H	HRN ASS'Y 2X5P TO 1X9P 90mm UL3302#28	
POWER CORD	27.LH60J.001	453070800820R	PWRCORD 16A/250V BLK 1830mm VDE H05VV-F	
CABLE	50.LBQ0J.001	453010100380R	CABLE,D-SUB 15P MALE 6FT BLACK/BLUE, ROH	
CABLE	50.L63VF.003	453030300120R	CABLE AUDIO 1P 6FT BLACK/GREEN CP03B06P0	
CABLE	50.LFM0J.001	453030300410R	CABLE HDMI-HDMI 19P 1.8M BLK ROHS	
CABLE	50.E120J.006	453030300490R	CABLE DVI 18+1P TO HDMI 19P 1.8M BLACK R	
BACK COVER	60.LH60J.002	714050031700R	ASSY,BACK,COVER,AUO,BLACK,LP2479	

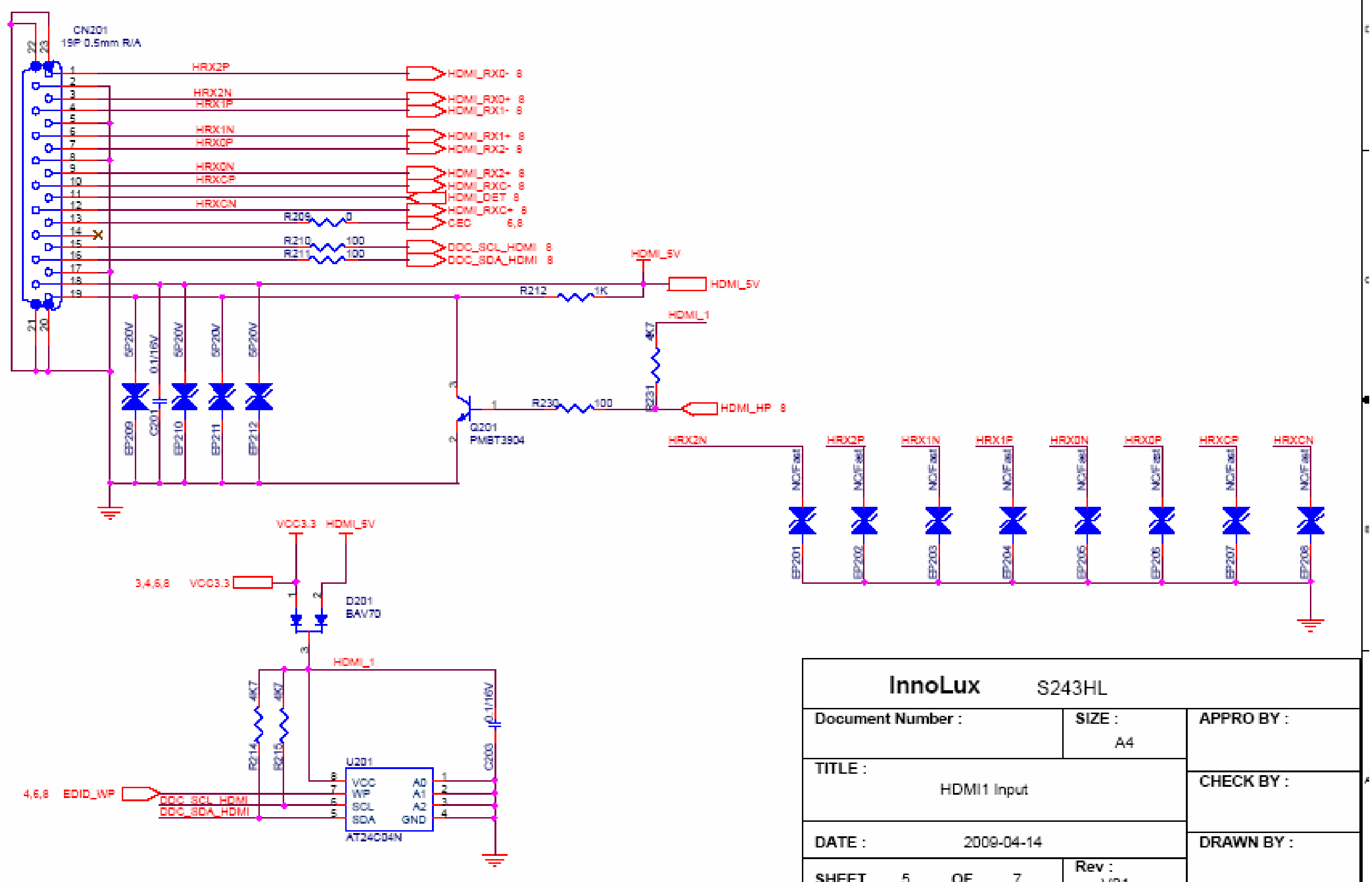
06 Schematics and Layouts



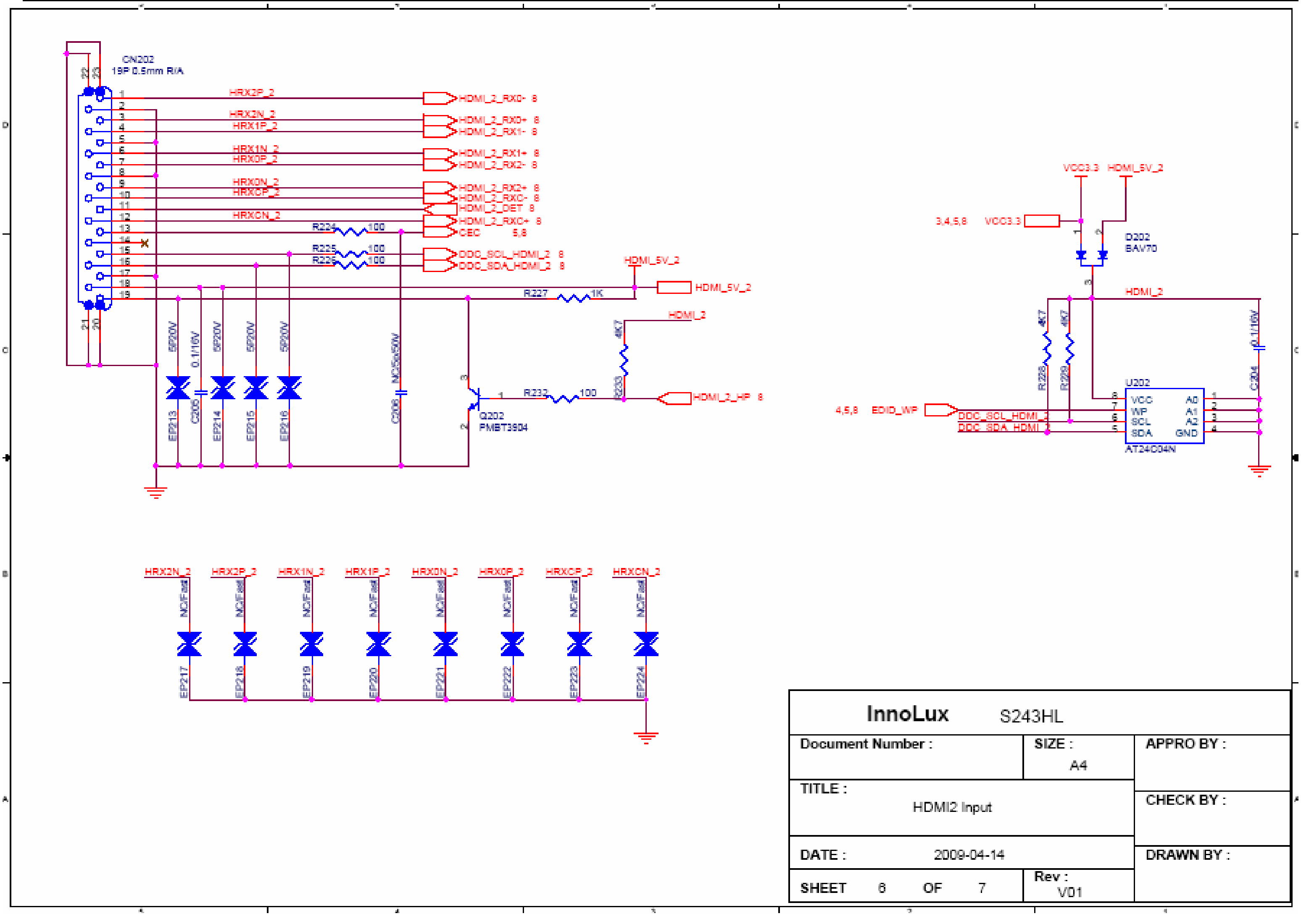

VCC5V
VCC3.3
VCC1.8
U103
AS1117L-3.3TR-LF
U104
AS1117L-1.8TR-LF
VIN VOUT
ADJ
100u/16V
0.1/16V
C109
C111
C112
LED_A
LED_G
Q105
PMBT3904
Q106
PMBT3904
R115
R119
100
4K7
R114
R116
R118
R120
LED_A_C 8
LED_G_C 8
CN101
2x5P 2.0mm
8 RIGHT/LEFT
MENU 8
AUTO/E-COLOR 8
8 POWER
NC/100p/50V
C114
C117
C119
C120
C118
C116
C115
CN101:pin3,pin4不要過孔,用於防呆
R183
R184
CCFL_ENABLE 2
8 BL_ENABLE
Q107
PMBT3904
Q102
AP2305GN
VLCD
VLCD 8
C107 0.1/16V
20K
R111
Q103
2N7002
51
R110
220u/10V
C108
C110
8 Panel_Enable
R112
100K
Q104
PMBT3904
1uF/10V
47K
C113
R113
InnoLux S243HL
Document Number :
SIZE : A4
APPRO BY :
TITLE : DC to DC
CHECK BY :
DATE : 2009-04-14
DRAWN BY :
SHEET 3 OF 7
Rev : V01



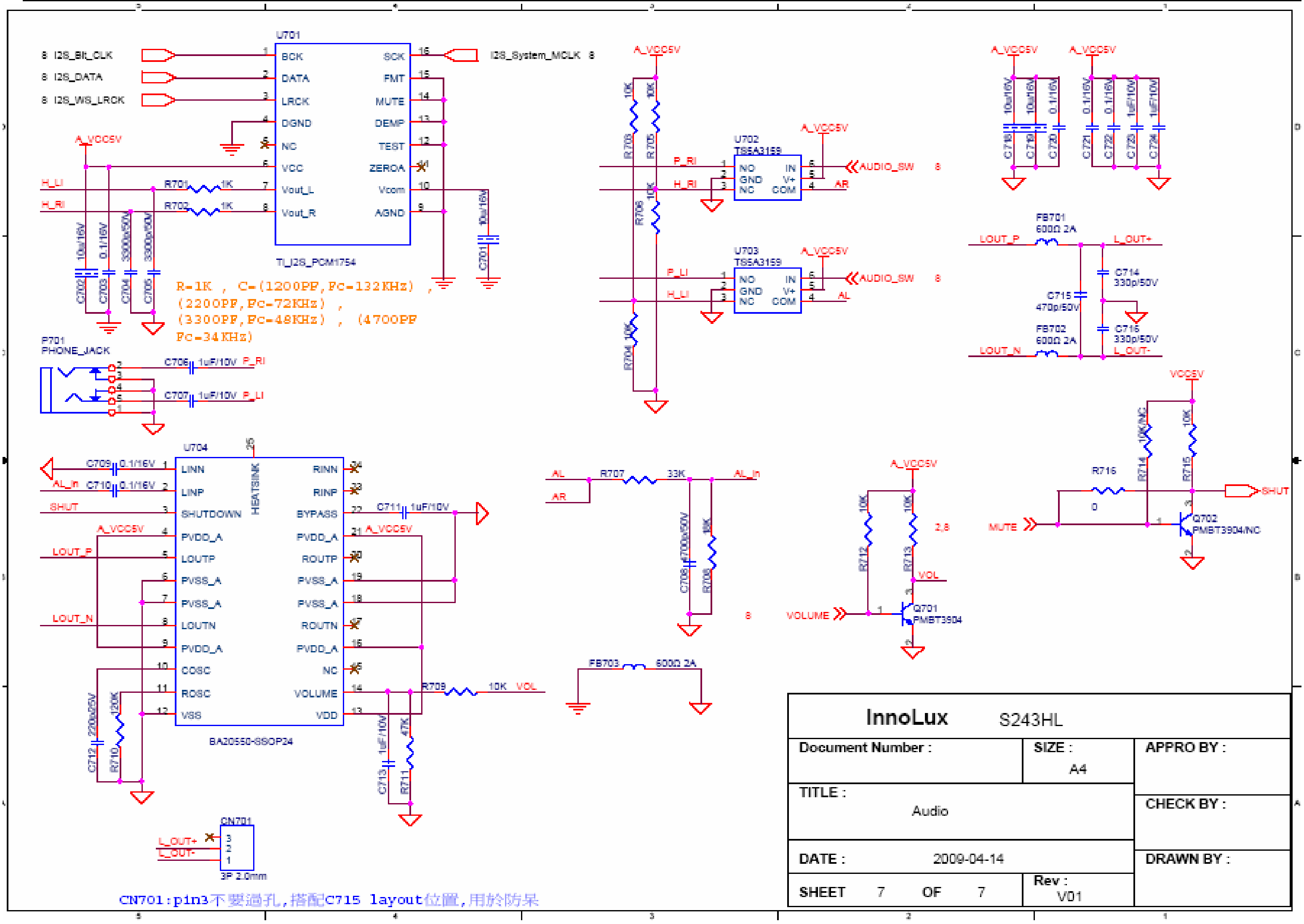
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TITLE : VGA Input		CHECK BY :
DATE : 2009-04-14		DRAWN BY :
SHEET 4 OF 7	Rev : V01	



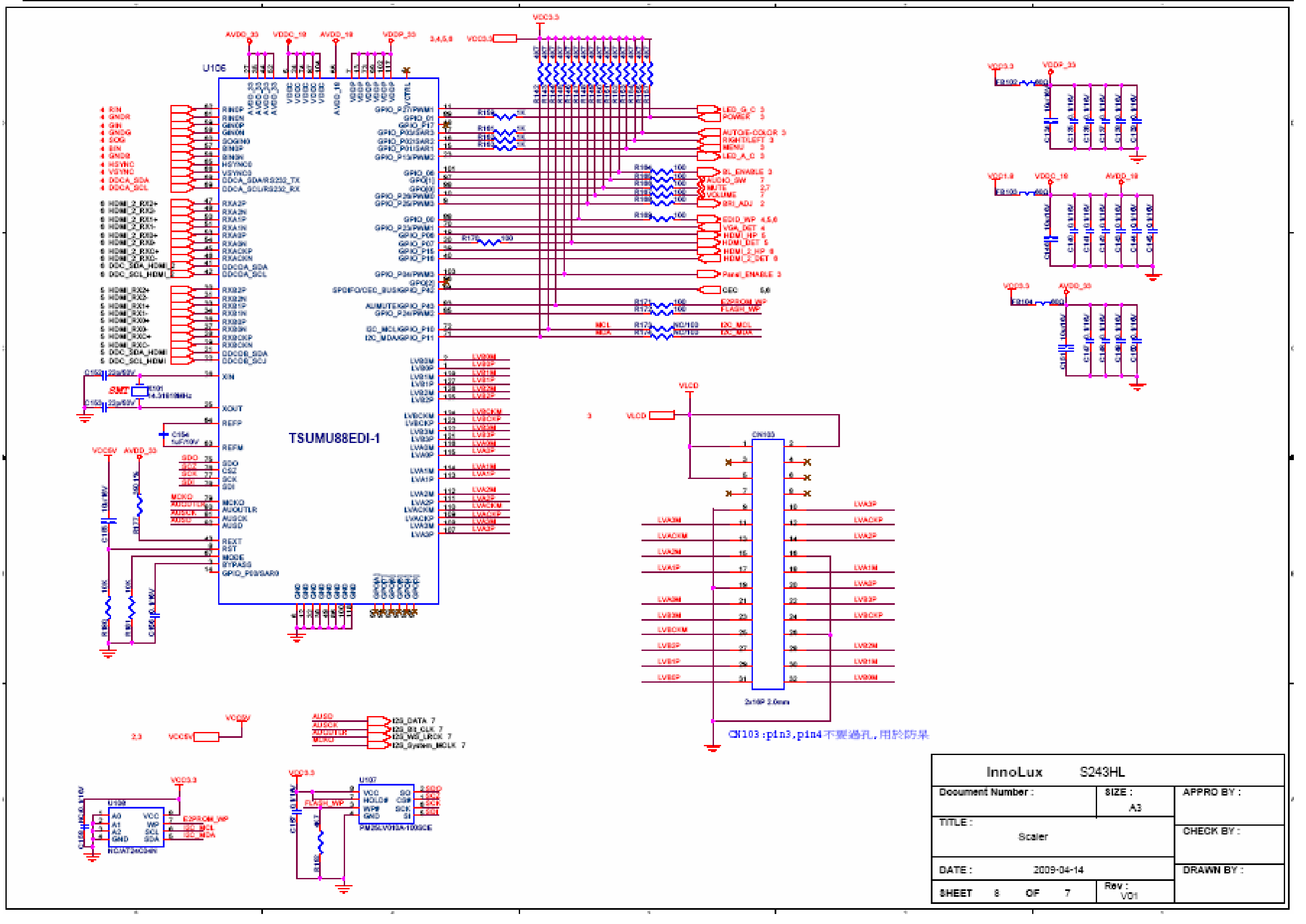
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TITLE : HDMI1 Input		CHECK BY :
DATE : 2009-04-14		DRAWN BY :
SHEET 5 OF 7	Rev : V01	



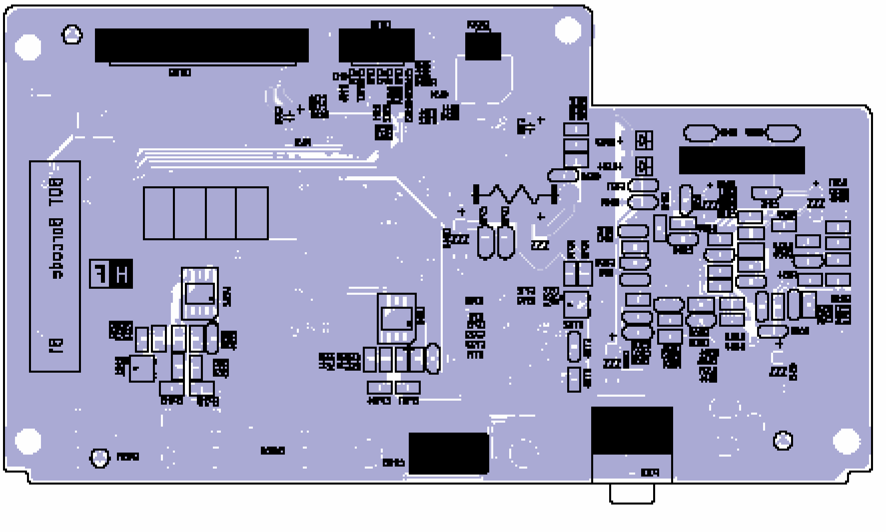
CN202
19P 0.5mm R/A
HRX2P_2
HRX2N_2
HRX1P_2
HRX1N_2
HRX0P_2
HRX0N_2
HRXCP_2
HRXCN_2
HDMI_2_RX0- 8
HDMI_2_RX0+ 8
HDMI_2_RX1- 8
HDMI_2_RX1+ 8
HDMI_2_RX2- 8
HDMI_2_RX2+ 8
HDMI_2_RXC- 8
HDMI_2_DET 8
HDMI_2_RXC+ 8
CEC 5,8
DDC_SCL_HDMI_2 8
DDC_SDA_HDMI_2 8
R224 100
R225 100
R226 100
R227 1K
HDMI_5V_2
HDMI_2
R232 100
R233 4K7
HDMI_2_HP 8
Q202
PMBT3904
5P20V
0.1/16V
C205
C206
NC/25x50W
EP213
EP214
EP215
EP216
VCC3.3
3,4,5,8
D202
BAV70
R228 4K7
R229 4K7
C204 0.1/16V
U202
VCC WP SCL SDA
A0 A1 A2 GND
AT24C04N
4,5,8 EDID_WP
NC/Fast
EP217
EP218
EP219
EP220
EP221
EP222
EP223
EP224
InnoLux S243HL
Document Number :
SIZE : A4
APPRO BY :
TITLE : HDMI2 Input
CHECK BY :
DATE : 2009-04-14
DRAWN BY :
SHEET 6 OF 7
Rev : V01



InnoLux	S243HL		
Document Number :	SIZE : A4		APPRO BY :
TITLE : Audio			CHECK BY :
DATE : 2009-04-14			DRAWN BY :
SHEET 7 OF 7	Rev : V01		

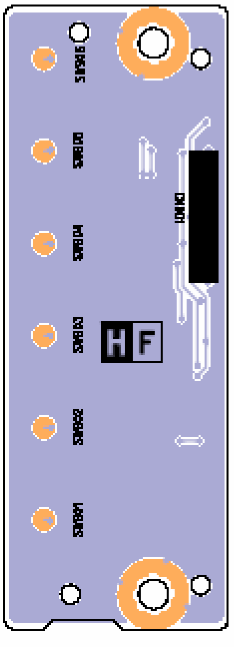


6.2 S243HL IF BD LAYOUT

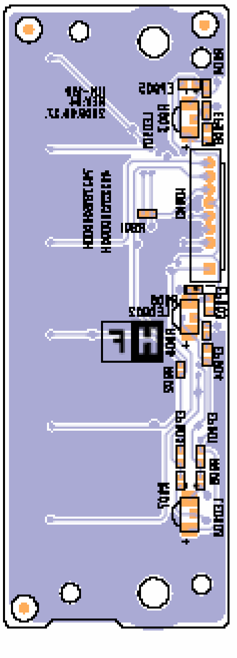


6.3 S243HL Key-pad Layout

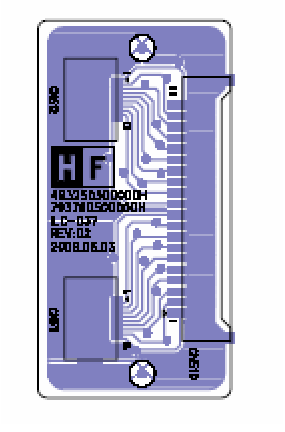
LAYER	SILKSCREEN TOP			
PCB NO :	493251500000H	REV :	04	DESIGNER: LIU HUA
FILE NAME :	ILK-180 .PCB	DATE :		2009.05.27



LAYER	SILKSCREEN BOTTOM			
PCB NO :	493251500000H	REV :	04	DESIGNER: LIU HUA
FILE NAME :	ILK-180 .PCB	DATE :		2009.05.27



6.4 S243HL 轉接板 Layout



07 Assembly and Disassembly

S1: Take out the LCD TV panel



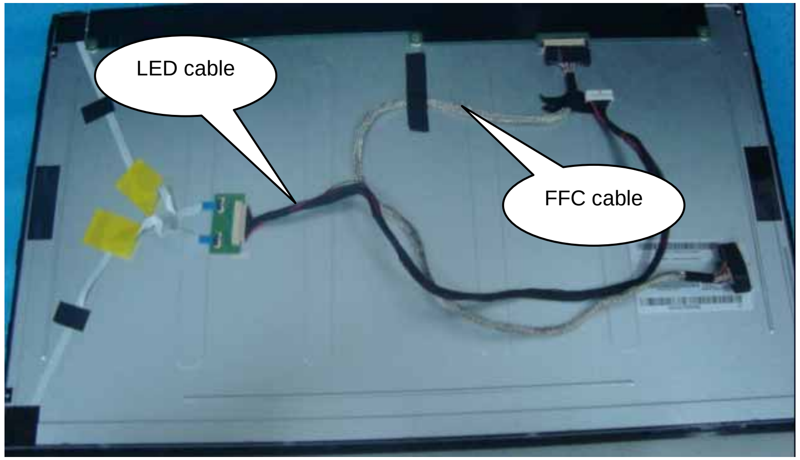
S2: Take out the bezel



S3: Assemble the panel with bezel



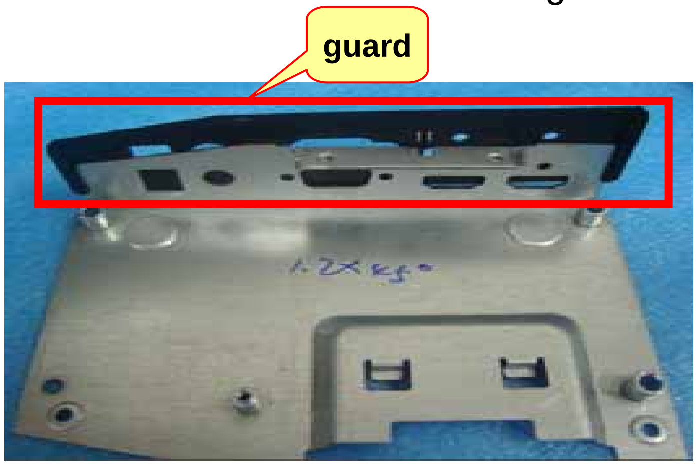
S4: Plug in the FFC cable and LED cable



S5: Take out a chassis



S6: Assemble the chassis and a guard.



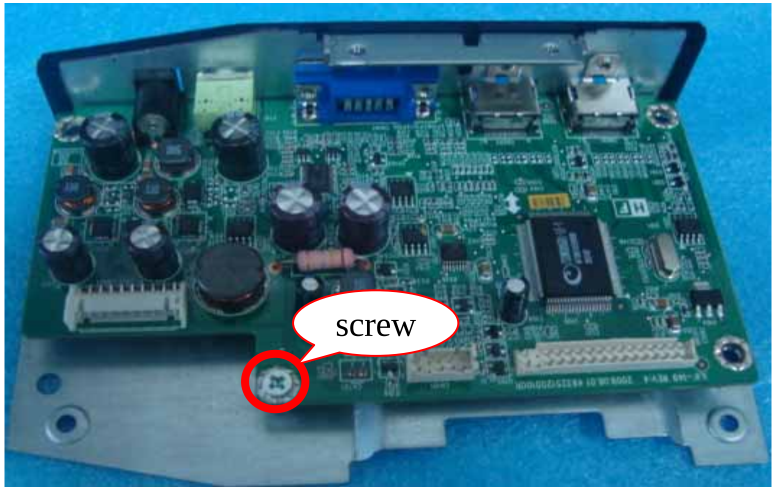
S7: Take out a main board



S8: Assemble the chassis and the main board



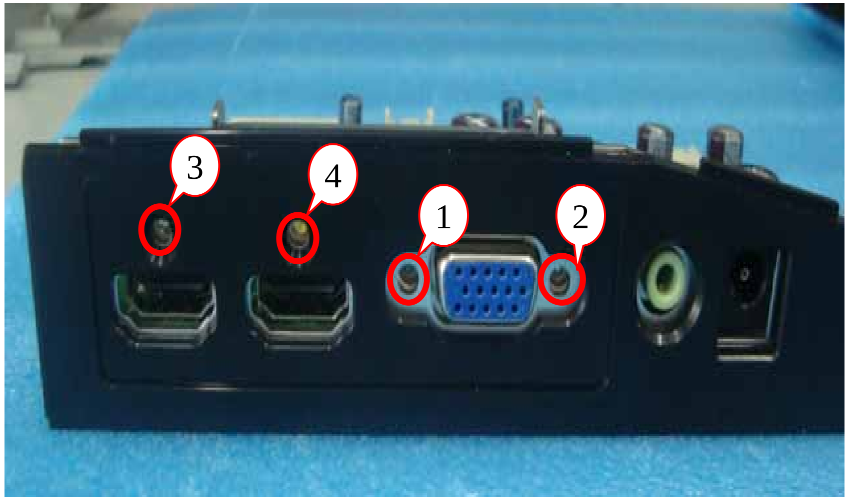
S9: Use a screwdriver to lock the screw



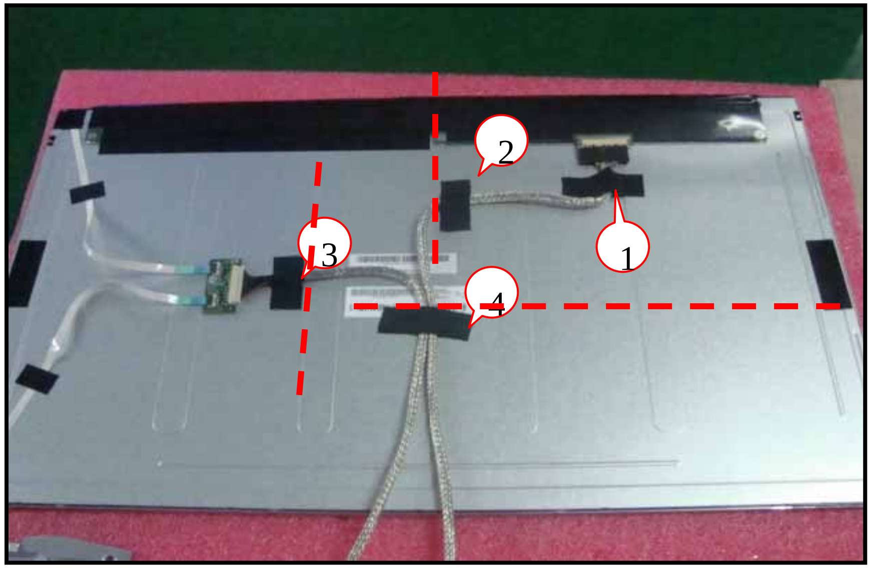
S10: Take out a shield and assemble the shield on the main board with a screw locked.



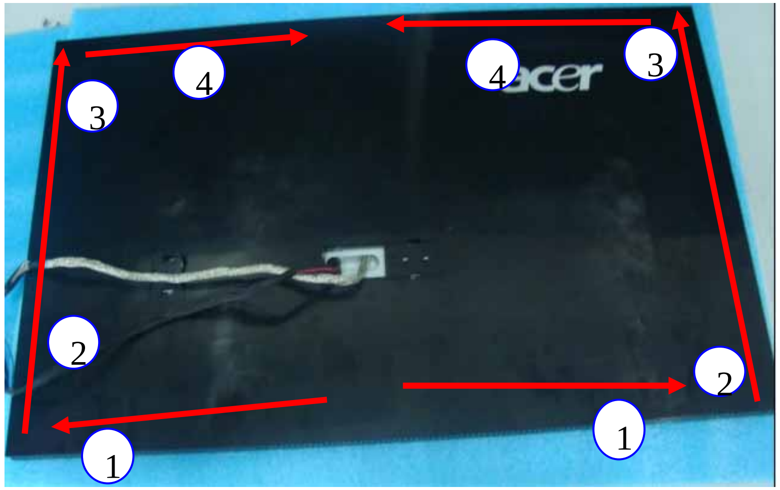
S11: Use a screwdriver to lock the screws



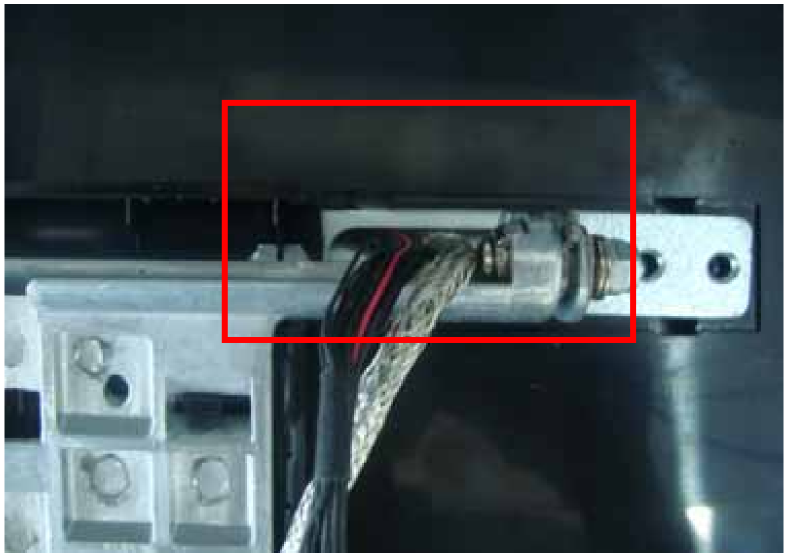
S12: Use 4 tapes to fix the FFC cable and LED cable



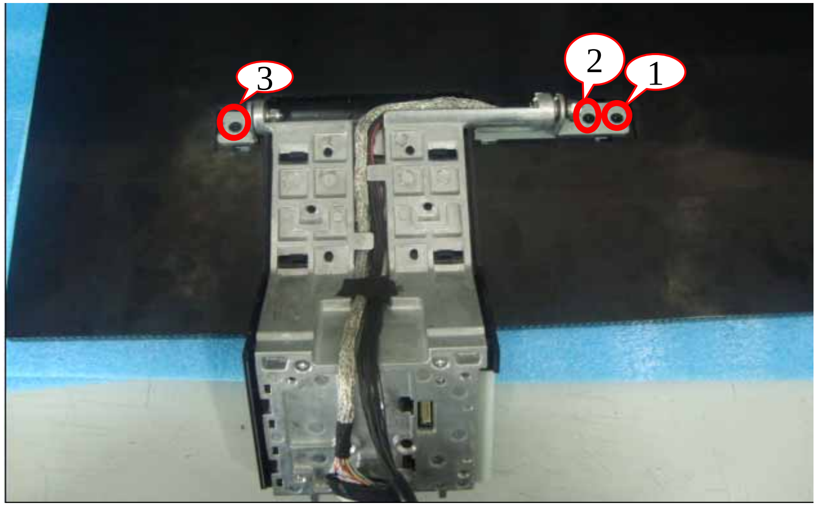
S13: Assemble the back cover with the panel.



S14: Take out a stand back. Take the FFC cable and LED cable out of the hole of the stand.



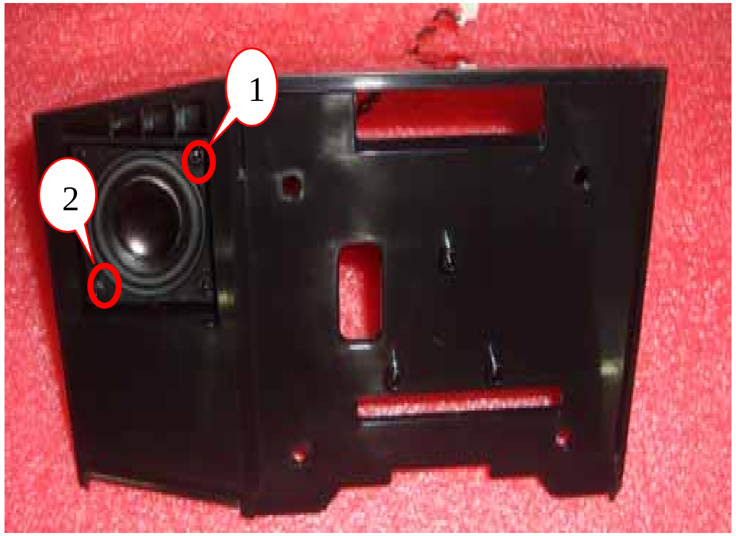
S15: Use a screwdriver to lock the screws.



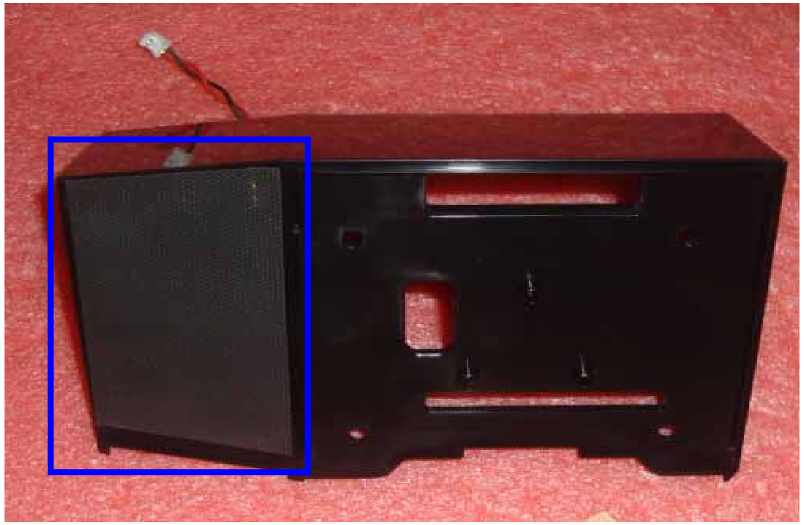
S16: Take out a keypad cable and plug it in the stand.



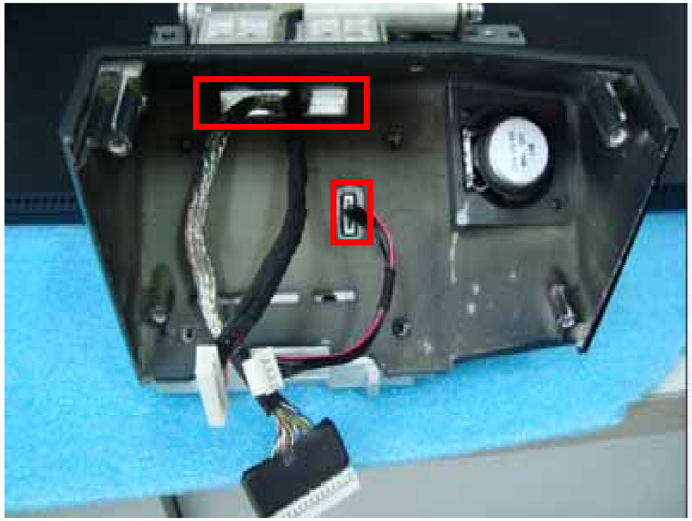
S17: Use a screwdriver to lock the screws to fix the speaker.



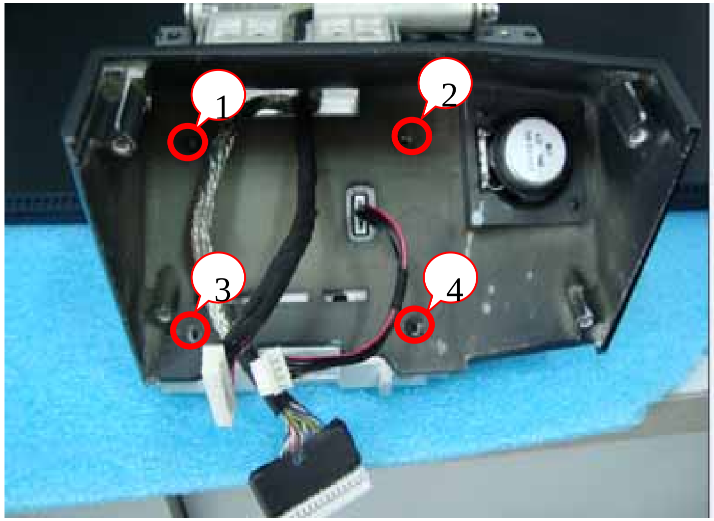
S18: Take out a shelter to stick on the speaker.



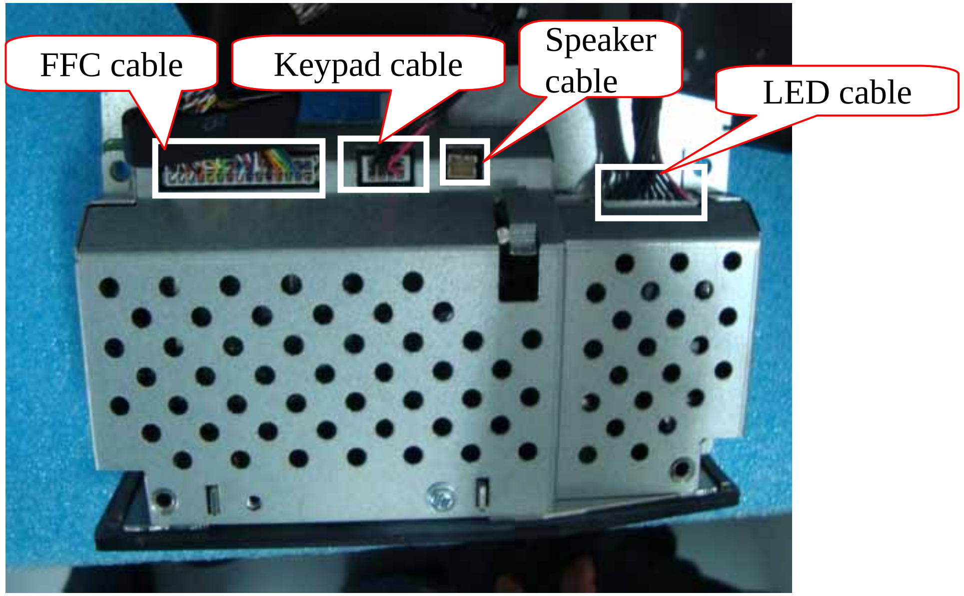
S19: Take the FFC cable, LED cable and keypad cable out of the corresponding hole.



S20: Use a screwdriver to lock the screws



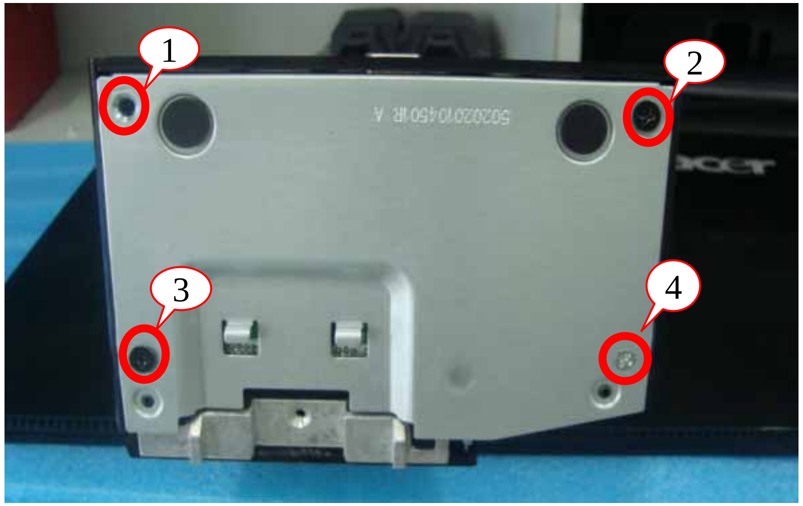
S21: Plug the FFC cable, Keypad cable, Speaker cable and LED cable in the main board.



S22: Assemble the chassis assembly with stand.



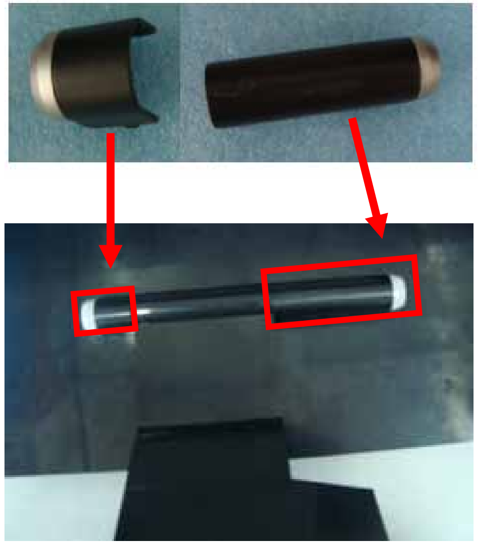
S23: Use a screwdriver to lock the screws



S24: Take out a stand cover and assemble it with the stand.



S25: Take out the left cover hinge and the right cover hinge. Assemble them and the stand.



S27: Take two spacers to stick on the chassis.



S26: Assemble the stand with the base.

